Massachusetts Births 2007

Massachusetts Department of Public Health

Bureau of Health Information, Statistics, Research, and Evaluation
Division of Research and Epidemiology

February 2009

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Note to Readers

Please review the information below before reading the report.

1. **Population**: Population estimates from the National Center for Health Statistics for 2005, which are the most up-to-date information available on the number of persons by age, race and sex at the sub-state level, were used to calculate community rates. Data for 2007 were used to calculate state-wide rates, e.g., fertility rate, teen birth rate, etc. **Please note**: If the population in your community increased from 2005 to 2007, the rates listed in this publication may **overestimate** the actual rate. If the population in your community declined from 2005 to 2007, the rates given in the publication may **underestimate** the actual rate. As soon as new population data are available for cities and towns, revised rates will be available from MassCHIP (http://masschip.state.ma.us). Please see the Appendix for detailed information about population.

2. **Rate, Proportion, and Number comparisons**: The comparison of rates, proportions, and numbers is based on tests of statistical significance. Comparative words, for example, "higher", "lower", "increase", and "decrease" are used only when the statistics being compared are statistically different (i.e., statistically significant at the $P \leq .05$ level). Please see the Technical Notes for a discussion of how statistical significance is determined.

3. **Comparisons with National Birth Statistics:** Because U.S. birth statistics for 2007 were not available at the time of publication of this report, we are using the national statistics from 2006. Although a direct comparison cannot be made between statistics from different years, we are presenting the U.S. statistics for 2006 to give a sense how Massachusetts statistics differ from those of the U.S.

4. **Infant Mortality:** The infant mortality statistics reported in this report are based upon a preliminary death file. Infant mortality statistics based upon the final death file may differ with those in this report.

5. **Resident births:** All data in this publication are resident data unless otherwise stated. Resident data include all events that occur to residents of the Commonwealth, wherever they occur

6. **Race and Ethnicity:** In the text, the race categories, White, Black, American Indian, Asian, and Hispanic are mutually exclusive, for example, when we refer to White mothers, this means white non-Hispanic mothers, with the exception of Table 21 (see notes for Table 21).

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Highlights

- The percentage of mothers with gestational diabetes mellitus (GDM) increased by 12% from 3.8% in 2006 to 4.2% in 2007.

- In 2007, for the first time since 1998, the cesarean delivery rate did not increase significantly from the previous year. The rate in 2007 was 33.7%, compared with the 2006 rate of 33.4%.

- Compared with 2006, there was a 13% increase in births to mothers whose ancestry is African (175 births). Overall, births to African mothers (1,477) accounted for 2% of Massachusetts births in 2007.

- The Massachusetts Infant Mortality Rate (IMR) did not change significantly from the prior year. In 2007, the IMR was 4.9 infant deaths per 1,000 live births compared with 4.8 infant deaths per 1,000 live births in 2006.

- The percentage of mothers who had their prenatal care paid by public programs continues to increase. Between 2006 and 2007, it increased by 4%, from 34.2% in 2006 to 35.5% in 2007. For white mothers, it increased by 7% (24.4% vs. 22.9%).

- Overall, breastfeeding remains high at close to 80%. Only blacks had an increase in breastfeeding, from 80.7% in 2006 to 82.8% in 2007.

- Disparities in birth outcomes by race, ethnicity, education, and community persist.
    - The black IMR was 2.6 times higher than the white IMR (10.2 vs. 3.9 infant deaths per 1,000 live births).
    - The teen birth rate for Hispanics was over 5 times higher than that of whites (70.9 vs. 13.3 births per 1,000 women ages 15-19).
    - Among the largest ethnicity groups, prenatal care in the first trimester was lowest among Cambodian (56.8%), Cape Verdean (69.0%), Haitian (69.1%) and African (69.3%) mothers, while Korean (86.7%) and European mothers (86.2%) had the highest. The state average was 82.0%.
    - Compared with mothers who had a college degree or more, mothers with a high school education or less were less likely to receive adequate prenatal care, more likely to report smoking during their pregnancies, and more likely to deliver low birthweight (LBW) infants (less than 2,500 grams or 5.5 pounds).
    - Among the 30 largest Massachusetts municipalities, Pittsfield, New Bedford and Springfield recorded the highest percentages of LBW (10.7%, 10.5%, and 10.4% respectively).

- The 2007 teen birth rate[1] in Massachusetts (22.0 births per 1,000 women ages 15-19) was 48% lower than the 2006 U.S. rate of 41.9 births per 1,000 women ages 15-19. The 2007 cesarean delivery rate in Massachusetts (33.7%) was 8% higher than the 2006 U.S. rate (31.1%).

[1] State teen birth rates were calculated using 2007 population data; however, please note that 2007 community teen birth rates use 2005 population estimates.

Introduction

This report presents detailed data on the number and characteristics of Massachusetts births in 2007 including maternal behaviors and health characteristics, medical services utilization by pregnant mothers, and infant health characteristics. These data are obtained from the Massachusetts Standard Certificate of Live Birth and the accompanying confidential health and demographic data for each birth record. Birth certificate data are essential for surveillance, research, and development of programs such as universal newborn hearing screening, high risk infant identification, and birth defects surveillance. The Registry of Vital Records and Statistics plays a critical role in the collection of birth information for administrative purposes and provides maternal and child health (MCH) data for decision-making, which guides many public health initiatives.

Methods

Data on births are based on information from the Massachusetts Standard Certificate of Live Birth filed with the Registry of Vital Records and Statistics. Medical information, such as birthweight and gestational age is based on information supplied by hospitals. Demographic and behavioral data such as race and ethnicity, and smoking during pregnancy are supplied by the women who gave birth. For example, women chose their race from five categories: White, Black, Asian/Pacific Islander, American Indian, and Other. Mothers identified their ancestry by selecting one of the 38 ancestry/ ethnicity groups[2].

Vital statistics birth data may be presented in terms of either maternal residence or place of birth. Resident data include all events that occur to residents of the Commonwealth, regardless of where they happen. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Occurrence data include all events that occur within the state, whether to residents or nonresidents. All data in this publication are for Massachusetts residents unless otherwise stated. There is an exchange agreement among the 50 states, District of Columbia, Puerto Rico, Virgin Islands, Guam, and Canadian provinces that allows for the exchange of statistical copies of birth and death records for events occurring in a state other than the state of residence.

[2] See the “Technical Notes” for a list of ancestries listed in check boxes.

Results

Number and Birth Rate

In 2007, there were 77,934 births to Massachusetts resident mothers compared with 77,670 in 2006. From 1990, the number of births to Massachusetts residents has declined by 16%. The birth rate (defined as the number of births per 1,000 women ages 15-44) among women of reproductive age declined by 8% between 1990 and 2007 (Table 1).

The mean or average maternal age at first birth in 2007 was 27.6 years, which was a small but significant decrease (0.5%) from the 2006 mean age (27.7 years). Asian mothers had the highest mean age at first birth (29.1 years) and Hispanic mothers had the lowest mean age (23.0 years). The mean age at first birth decreased by 0.7% for white mothers (from 28.7 in 2006 to 28.5 years in 2007). There were no significant changes in the mean age at first birth for other groups.

Births by Race, Hispanic Ethnicity, and Mother's Birthplace

The percentage of births to white mothers decreased by 1%, from 68.2% in 2006 to 67.5% in 2007. There has been an overall decrease of 14% in the percentage of births to white since 1990, when it was 78.4%. In 2007, the percentage of births to Asian, Hispanic, and black mothers remained stable from the 2006 figures; however, these percentages have increased since 1990 by 106%, 53%, and 8%, respectively (Table 1).

The percentage of births to non-U.S.-born mothers remained stable between 2006 and 2007 at about 27%, but there was a 4% increase in the percentage of non-U.S.-born black mothers and a slight, but significant, decrease in the percentages of non-U.S.-born Asian and Hispanic mothers (Table 2).

Emerging Populations

While the overall number of Massachusetts births remained stable from 2006 to 2007, the number of births to African mothers has increased by 13% since 2006, from 1,302 to 1,477 in 2007 (Table 3).

Births by Age Group

There had been a marked change in the age of Massachusetts mothers since 1980. Approximately 25% of women giving birth in 1980 were 30 years and older compared with 53% in 2007 (Figure 1).

Compared with 1990, birth rates have increased among mothers ages 30 and older, and decreased among mothers under 30 years. The largest increases in birth rates have been among the older age groups, 40-44, 45-49, and 50-54 years while the largest decreases have been among the youngest age groups, 10-14 and 15-19 years. In 2007, there were 49 births to mothers ages 10-14 years (a difference of 7 births from 2006). There were 650 more births to women ages 25 to 29 years in 2007 compared with 2006, representing a significant increase in the birth rate for this group (93.1 vs. 90.0 births per 1000 women in that age category) (Table 4).

Marital Status

The percentage of mothers who were not married at the time of delivery increased by 4% from 32.2% in 2006 to 33.4% in 2007, which continues an increasing trend since 1996. Since 2003, the increase has been about 5% per year (Table 1). In 2007, Hispanics continued to have the highest percentage of unmarried mothers at 67.0%, which was an increase of 2% from 2006.

The percentage of unmarried white mothers increased by 7% from 23.2% in 2006 to 24.9% in 2007.

Breastfeeding

The percentage of mothers who breastfeed or intended to breastfeed in 2007 was 79.2%, which was significantly lower than the 79.9% rate in 2006. The rate of breastfeeding has increased by 52% since 1989 when it was 52.2%. Among race and ethnicity groups, Asians had the highest percentage of breastfeeding, 86.1% (Table 2). The percentage of mothers who were breastfeeding decreased for whites from 78.2% in 2006 to 77.3% in 2007 and, for Hispanics, from 82.6% in 2006 to 81.1% in 2007. Only blacks had an increase in the percentage of breastfeeding, from 80.7% in 2006 to 82.8% in 2007.

Multiple Births

In 2007, 95.6% of births were singletons (74,498 births), 4.2% were twins (3,310 births), and 0.2% were triplets or higher order multiples (126 births) (Table 5). The percentage of births that were multiples has been stable for the last three years. The total percentage of multiple births (twins, triplets or more) was 4.4 in 2007 and 4.5% in 2006. This percentage decreased by 8% from 2004 when it was 4.8%. In 2007, the percentage of multiple births among mothers ages 35 years and older was 6.8%, nearly double the percentage for mothers under age 35 (3.7%).

White mothers continue to have the highest percentage of multiple births at 5.1%. The percentage of multiple births decreased for blacks from 4.0% in 2006 to 3.1% in 2007. There were no other significant changes from 2006 to 2007 in the percentage of multiple births by race and ethnicity.

Teen Births

In 2007, there were 4,944 births among residents ages 15-19 years, which represents 222 additional births from 2006 (Table 1). The Massachusetts teen birth rate has decreased from 35.4 births per 1,000 women ages 15-19 years in 1990 to the current figure of 22.0 in 2007. The Massachusetts teen birth rate in 2007 was 48% below the 2006 U.S. teen birth rate of 41.9 births per 1,000 women ages 15-19 years [3].

In 2007, less than one-third of teen births were to women under 18 (1,592 births), and more than two-thirds were to women 18 and 19 (3,401) (Table 6). The annual number of births to young teens (ages 10-14) was 49 in 2007 compared with 56 in 2006, representing a 68% decline since 1994 when there were 155 births. In Massachusetts, in 2007, the youngest mother was 13.

There were no significant changes from 2006 to 2007 in the birth rate to young teens (ages 10-14 years) by race and ethnicity. The 2007 birth rate for young teens was 0.25 live births per 1,000 females, which was 58% below the 2006 U.S. rate (0.6).

In 2007, teen birth rates decreased for all race and ethnicity groups compared with 1997 rates (Figure 2). In 2007, the teen birth rate for Hispanics was over 5 times higher that for whites (70.9 vs. 13.3 per 1,000 women ages 15-19 years). There were no significant changes in teen birth rates by race and ethnicity compared with 2006, but all rates except for Asians have declined since 2000.

[3] Martin JA, Hamilton BE, Sutton PD, Ventura SJ, et al. Births: Final data for 2006. National vital statistics reports; vol 57 no 7. Hyattsville, MD: National Center for Health Statistics. 2009.

Among Massachusetts municipalities with the highest *number* of teen births, teen birth *rates* were highest in Holyoke (95.4), Springfield (84.3), Chelsea (82.0), Southbridge (77.1), and Lawrence (76.0)[4]. These communities had rates over 3 times the statewide rate of 22.0 teen births per 1,000 women ages 15-19 years (Table 7). There were no significant changes from 2006 teen birth rates by communities.

Low Birthweight

The percentage of low birthweight (LBW) infants (less than 2,500 grams or 5.5 pounds) was 7.9% in 2007, which was the same as it was in 2006. The percentage of LBW infants has increased by 36% since 1990 when it was 5.8% (Table 8). Since 2005, LBW in Massachusetts has remained stable. The percentage of low birthweight and very low birthweight (VLBW) among multiple births is much larger than that among singletons. In 2007, 5.7% of singleton births were LBW, whereas 53.6% of twins and 92.9% of higher order births were LBW (Table 9).

Black infants continue to have the highest percentage of LBW at 11.1%. There were no significant changes from 2006 to 2007 in LBW percentages by race and ethnicity. Among maternal ancestry groups, Cambodian (12.9%), Haitian (12.5%), African American (12.3%), Cape Verdean (9.7%), and Puerto Rican (9.6%) mothers had higher LBW rates than the state overall (7.9%). Mexican (4.5%), Guatemalan (5.3%), Middle Eastern (5.5%), Brazilian (5.8%), and Chinese (6.0%) mothers had lower LBW rates than the state (Table 3).

The percentage of very low birthweight (VLBW) infants (less than 1,500 grams or 3.3 pounds), was 1.4% in 2007, similar to 2006. Black infants continue to have the highest percentage of VLBW at 2.6% (Table 8). Although low to begin with, the percentage of VLBW increased by 42% for Hispanic mothers (from 1.2% in 2006 to 1.7% in 2007). There were no other significant changes from 2006 to 2007 in the percentage of VLBW infants by race and ethnicity.

Preterm Deliveries

The percentage of preterm infants (infants delivered before the 37th week of gestation) was 9.0% in 2007, same as in 2006 (Table 1). Black mothers continue to have the highest percentage of preterm infants at 11.1%. The percentage of preterm infants decreased only for black mothers from 2006 to 2007 (down 14%, 11.1% vs. 12.9%) from 2006. There were no other significant changes from 2006 to 2007 in the percentage of preterm infants by race and ethnicity.

The percentage of infants delivered very early (before the 28th week of gestation) has remained the same since 1997 at 0.6% (close to 500 births each year). Black women had the highest proportion of infants delivered very early, 1.5%, which was more than double that of any other race group (Table 10).

In 2007, the percentage of late preterm births (34-36 weeks of gestation) was 6.4% (Table 10). This percentage has been increasing at about 3% per year since 1997 when it was 5.0%.

Smoking

The percentage of mothers who reported smoking during pregnancy was 7.5% in 2007 compared with 7.4% in 2006 and has declined by 61% since 1990 (19.3%) (Figure 3). White

[4] Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. **Please note**: If the population in your community increased from 2005 to 2007, the rates listed may **overestimate** the actual rate. If the population in your community declined from 2005 to 2007, the rates given in the publication may **underestimate** the actual rate.

mothers continued to have the highest reported percentage of smoking during pregnancy at 8.8% followed by black and Hispanic mothers at 5.3% (Figure 4). The rate for black mothers decreased significantly by 21%, from 6.7% in 2006 to 5.3% in 2007.

Prenatal Care

In 2007, the percentage of women receiving adequate prenatal care (PNC) was 82.8% compared with 83.1% in 2006 (Table 1). Adequacy of prenatal care is a measure of the timing and number of prenatal care visits, not an assessment of the quality of PNC.

The percentage of women receiving adequate PNC was significantly lower than the state average for Hispanic, black, and Asian mothers and it was significantly higher for whites. Seventy-five percent of Hispanic and 76.1% of black mothers received adequate prenatal care, compared with 85.4% of white mothers. The rate for Asian mothers was 81.5% (Figure 5).

Mothers with less than a high school education were less likely to receive adequate prenatal care than were mothers with a college degree or higher education (70.7% vs. 88.8%) (Figure 6). Younger teens (ages 17 years or younger) were less likely to receive adequate prenatal care than mothers ages 35 years and older, 66.2% compared to 87.6%.

Publicly Financed and Privately Insured Prenatal Care

Maternal characteristics and birth outcomes varied according to whether PNC was paid through public programs or through private insurance. The percentage of mothers who had their prenatal care paid through public programs increased significantly by 4%, from 34.2% in 2006 to 35.5% in 2007 (Figure 7). Among white mothers, this rate increased by 6% from 2006. Hispanic mothers continue to have the highest percentage of prenatal care paid by public funds at 74.0%, followed by black mothers (60.9%).

Overall in Massachusetts, 25.9% of mothers had prenatal care paid by Medicaid/ MassHealth. However, Medicaid/MassHealth payment among those varied largely by race and Hispanic ethnicity. About half of Hispanic and black mothers had their PNC paid by Medicaid/MassHealth; whereas, 21.1% of Asian and 18.8% of white mothers' PNC was paid by Medicaid/MassHealth (Table 30).

Cesarean Delivery

In 2007, the cesarean delivery rate did not increase significantly from the previous year for the first time since 1998. The 2007 cesarean delivery rate was similar to that in 2006 (33.4% in 2006 vs. 33.7% in 2007) (Table 1). The cesarean rate in Massachusetts in 2007 was 8% higher than the 2006 nationwide rate of 31.1%.

The percentage of cesarean delivery remained stable for all racial and ethnic groups, between 2006 and 2007. Hispanic and Asian mothers had the lowest percentages (28.5% and 30.1%, respectively). White and black mothers continue to have the highest rates (35.1% and 34.6%, respectively). Brazilian mothers had the highest percentage of cesarean deliveries (44.7%) and Cambodian (17.1%), Guatemalan (21.8%), and Salvadoran (22.1%) mothers had the lowest percentage of cesarean deliveries (Table 3).

Gestational Diabetes Mellitus

In 2007, the proportion of births to mothers diagnosed with gestational diabetes mellitus (GDM) increased by 12% from 2006, and by 49% from 2000. The prevalence of GDM increased from 3.8% in 2006 to 4.2% in 2007 (Table 1). This increasing trend is also seen nationwide. In 2005, 3.8% of all U.S. pregnancies, or about 160,000 U.S. pregnancies were complicated by

gestational diabetes, and in 2006, the gestational diabetes rose to 4.2% of all pregnancies, or about 180,400 pregnancies nationally.[5]

The prevalence of GDM varied by mother's race and Hispanic ethnicity. Asian mothers have the highest prevalence (7.3%), and white mothers and Hispanic mothers have the lowest prevalence (3.9% and 4.0%, respectively, not significantly different). In 2007, only white mothers experienced an increase in the prevalence of GDM from the previous year, from 3.5% in 2006 to 3.9% in 2007.

Among maternal ancestry groups, Asian Indian (9.3%), Chinese (8.0%), Vietnamese (7.0%), Haitian (6.8%), African (6.6%), and Salvadoran (6.3%) mothers had higher GDM prevalence than the state prevalence. Guatemalan (2.3%), Cape Verdean (2.7), Dominican (3.1%), European (3.3%), and African American (3.4%) mothers had lower GDM prevalence than the state's figure (Table 3).

Infant Mortality Rate (IMR)

In 2007, there were 380 infant deaths (deaths of infants less than one year of age), 11 more infant deaths than in 2006 (Table 11). The infant mortality rate was 4.9 deaths per 1,000 live births in 2007, compared with 4.8 deaths per 1,000 live births in 2006. This change was not significant. The infant mortality rate has decreased by 30% since 1990, from 7.0 deaths per 1,000 live births to 4.9 deaths per 1,000 live births.

In 2007, blacks continued to have the highest IMR among all race and ethnicity groups at 10.2 deaths per 1,000 live births compared to 11.1 deaths per 1,000 live births in 2006 (Figure 8). The white IMR was 4.2 in 2006 and 3.9 in 2007. The IMR for Asians was 1.8 in 2006 and 3.1 in 2007. The Hispanic IMR was 5.8 in 2006 and 7.4 in 2007. None of these changes was statistically significant (for confidence intervals, see Table 36).

Birth Characteristics in the 30 Largest Massachusetts Cities and Towns

In 2007, in the 30 largest municipalities in the Commonwealth (Table 12):

- Four communities had GDM percentages significantly higher than the statewide prevalence of 4.2%: Fall River (10.3%), Revere (6.6%), Lowell (5.9%), and Worcester (5.5%).

- Six communities recorded low birthweight percentages that were higher than the statewide average of 7.9%: Pittsfield (10.7%), New Bedford (10.4%), Springfield (10.4%), Brockton (10.0%), Lawrence (9.9%), and Boston (9.6%).
- Thirteen of the 30 largest communities had higher rates of smoking during pregnancy than the state rate of 7.5%. In Pittsfield (28.4%) the rate was almost 4 times higher than the state rate, and Fall River (19.6%), New Bedford (17.6%), Chicopee (15.2%), and Springfield (14.9%) had rates greater than twice the state rate (data not shown).

- Lawrence (74.1%) and Springfield (73.5%) mothers had the highest percentages of prenatal care paid by public funds, while Brookline (5.2%) and Newton (6.2%) mothers had the lowest.

[5] Martin JA, Hamilton BE, Sutton PD, Ventura SJ, et al. Births: Final data for 2006. National vital statistics reports; vol 57 no 7. Hyattsville, MD: National Center for Health Statistics. 2009. Note that he U.S. percentage is for diabetes during pregnancy and includes both prior diabetes and gestational diabetes. The MDPH figure is for gestational diabetes only. In a recent seven-state study, the percentage of gestational diabetes was reported as 4.4%.

- Fall River (13.1 deaths per 1,000 live births) was the only city that had an IMR higher than the state IMR of 4.9 deaths per 1,000 live births. Based on a three-year IMR from 2005-2007, which is a more stable rate than a one-year rate, Revere (10.4), Springfield (9.2), Worcester (9.0), New Bedford (8.7), and Fall River (8.5) had higher IMRs when compared with the state IMR (4.9 deaths per 1,000 live births).

Birth Characteristics by Facility

Listed below are facilities that in 2007 had the 3 highest and 3 lowest rates of cesarean deliveries, low birthweight infants, publicly funded deliveries, and deliveries with adequate prenatal care (Table 13).

Cesarean Section delivery (state rate 33.7%)

Highest percentages in:	
South Shore Hospital	44.3%
Melrose-Wakefield Hospital	43.7%
Caritas Holy Family and Medical Center	42.9%
Lowest percentages in:	
Tobey Hospital	17.1%
Heywood Memorial Hospital	18.8%
Holyoke Hospital	19.2%

Low Birthweight (LBW) (state rate 7.9%)

Highest percentages in:	
Tufts-New England Medical Center Hospital	26.2%
Caritas St. Elizabeth's Medical Center of Boston	13.8%
Beth Israel Deaconess Medical Center	12.7%
Lowest percentages in:	
Nantucket Cottage Hospital	1.3%
Fairview Hospital	1.9%
Cooley Dickinson Hospital	2.4%

Publicly Funded Delivery (state rate 34.9%)

Highest percentages in:	
Boston Medical Center	82.9%
Cambridge Hospital	74.5%
Holyoke Hospital	74.0%
Lowest percentages in:	
Newton Wellesley Hospital	4.2%
Winchester Hospital	5.7%
Emerson Hospital	7.0%

Adequacy of Prenatal Care by Facility (state rate 82.8%)

Highest percentages in:	
Beverly Hospital	95.7%
Brigham And Women's Hospital	95.4%
Martha’s Vineyard Hospital	93.3%

Lowest percentages in:	
Caritas Good Samaritan Medical Center	58.0%
Holyoke Hospital	59.7%
Morton Hospital	62.4%

Healthy People 2010 Objectives

Healthy People 2010 (HP2010) sets targets for each measurable Healthy People objective[6]. Table 14 presents the most recent Massachusetts data for HP2010 Maternal, Infant, and Child Health objectives and measures the state's progress toward meeting the targets set for 2010.

Out of 16 objectives presented, Massachusetts has met the 2010 target for only breastfeeding (Table 14). For nine objectives, the 2007 Massachusetts indicators are within 25% of the 2010 target goals: fetal mortality rate, perinatal mortality rate, neonatal mortality rate, post-neonatal mortality, preterm birth, early and adequate prenatal care, prenatal care beginning in the first trimester, very low birthweight infants born at Level III hospitals, and smoking during pregnancy. For five objectives, Massachusetts is still more than 25% away from achieving the 2010 targets: maternal mortality, low birthweight, very low birthweight, and Cesarean delivery (both low-risk women giving birth for the first time and for low-risk women with prior Cesarean delivery).

A Comparison of Massachusetts and U.S. Indicators

According to the U.S. birth statistics for 2006[7], the following Massachusetts perinatal health indicators in 2007 were significantly better than those for the U.S.:

- The teen birth rate in Massachusetts (22.0 births per 1,000 women ages 15-19) was 47% lower than the U.S. teen birth rate (41.9 births per 1,000 women ages 15-19).
- The percentage of unmarried mothers in Massachusetts (33.4%) was 13% lower than the U.S. percent (38.5%).
- The low birthweight rate in Massachusetts (7.9%) was 5% lower than the U.S. low birthweight rate (8.3%). Both rates are more than 50% above the HP2010 target (5.0%).
- The Cesarean delivery rate in Massachusetts (33.7%) was 8% higher than the U.S. Cesarean section rate (31.1%).
- The percentage of multiple births in Massachusetts (4.4%) was 30% higher than the U.S. percentage of multiple births (3.4%).

[6] U.S. Department of Health and Human Services. Tracking Healthy People 2010. Washington, DC: U.S. Government Printing Office, November 2000

[7] Martin JA, Hamilton BE, Sutton PD, Ventura SJ, et al. Births: Final data for 2006. National vital statistics reports; vol 57 no 7. Hyattsville, MD: National Center for Health Statistics. 2009.

According to the U.S. provisional birth statistics for 2007[8], the IMR in Massachusetts (4.9 deaths per 1,000 live births) was 26% lower than the U.S. IMR in 2007 (6.6 deaths per 1,000 live births).

[8] Tejada-Vera B, Sutton PD. Births, marriages, divorces, and deaths: Provisional data for 2007. National vital statistics reports; vol 56 no 21. Hyattsville, MD: National Center for Health Statistics. 2008.

Table 1. Trends in Birth Characteristics, Massachusetts: 1990, 1994-2007

Characteristic		1990	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Births[1]	**n**[2]	92,461	83,758	81,562	80,164	80,321	81,406	80,866	81,582	81,014	80,624	80,167	78,460	76,824	77,670	77,934
	Rate[3]	62.1	57.0	55.5	54.6	54.7	55.6	55.9	57.1	56.6	56.8	56.8	56.2	55.6	56.9	57.2
Race of Mother																
White non-Hispanic	**n**	72,483	64,589	63,043	61,829	61,204	61,764	60,402	60,051	59,115	58,136	57,604	55,322	53,469	52,975	52,620
	%[4]	78.4	77.1	77.3	77.1	76.2	75.9	74.7	73.6	73.0	72.1	71.9	70.5	69.6	68.2	67.5
Black non-Hispanic	**n**	7,158	6,262	5,858	5,491	5,482	5,549	5,844	5,755	5,862	5,948	5,902	6,053	6,077	6,452	6,462
	%[4]	7.7	7.5	7.2	6.9	6.8	6.8	7.2	7.1	7.2	7.4	7.4	7.7	7.9	8.3	8.3
Asian	**n**	3,349	3,325	3,355	3,398	3,719	3,748	4,138	4,667	4,784	5,300	5,224	5,454	5,251	5,469	5,758
	%[4]	3.6	4.0	4.1	4.2	4.6	4.6	5.2	5.7	5.9	6.6	6.5	7.0	6.8	7.0	7.4
Hispanic	**n**	8,406	8,429	8,077	7,756	8,211	8,665	8,815	9,247	9,410	9,543	9,764	9,798	10,061	10,696	10,861
	%[4]	9.1	10.1	9.9	9.7	10.2	10.6	10.9	11.3	11.6	11.8	12.2	12.5	13.1	13.8	13.9
Teen Births	**n**	7,258	6,412	5,990	5,758	5,801	5,823	5,515	5,305	4,979	4,642	4,639	4,559	4,539	4,722	4,944
(Ages 15-19)	**Rate**[3]	35.4	33.2	30.3	28.5	28.5	28.1	26.7	25.9	24.9	23.3	23.0	22.2	21.7	21.3	22.0
Births to Unmarried	**n**	22,837	22,302	20,857	20,253	20,640	21,191	21,448	21,621	21,620	21,604	22,262	22,376	23,170	24,977	26,010
Mothers	**%**	24.7	26.6	25.6	25.3	25.7	26.0	26.5	26.5	26.7	26.8	27.8	28.5	30.2	32.2	33.4
C-section	**n**	20,615	17,289	16,758	15,675	15,742	16,975	18,080	19,086	20,639	22,553	23,392	24,295	24,732	25,901	26,240
	%	22.3	20.6	20.6	19.6	19.6	20.9	22.4	23.4	25.5	28.0	29.2	31.0	32.3	33.4	33.7
Gestational	**n**								2,245	2,402	2,633	2,693	2,741	2,666	2,925	3,279
Diabetes[5]	**%**								2.8	3.0	3.3	3.4	3.5	3.5	3.8	4.2
Low	**n**	5,388	5,335	5,174	5,105	5,617	5,655	5,708	5,711	5,795	6,060	6,115	6,125	6,073	6,150	6,147
Birthweight	**%**	5.8	6.4	6.4	6.4	7.0	7.0	7.1	7.1	7.2	7.5	7.6	7.8	7.9	7.9	7.9
Preterm	**n**	5,899	6,492	6,438	5,705	5,831	6,117	6,136	6,582	6,412	6,795	6,963	7,222	6,925	6,954	6,980
	%	6.5	7.8	7.9	7.2	7.3	7.6	7.6	8.3	8.0	8.5	8.7	9.2	9.0	9.0	9.0
Adequate Prenatal Care																
Kessner Index[6]	**%**	80.1	84.3	84.2	79.9	80.0	79.8	79.4	79.1	80.4	79.9	79.9	79.5	78.9	77.6	77.8
APNCU Index[7]	**%**				83.3	82.9	82.9	82.9	83.3	85.2	84.7	84.5	84.2	84.0	83.1	82.8

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Births presented in all tables are resident live births unless otherwise specified. 2. Differences in numbers of births from previous publications are the result of updated files. 3. Birth rates represent the total number of births to women ages 15-44 years per 1,000 women ages 15-44; teen birth rates refer to number of births per 1,000 women ages 15-19. Population data for computing birth rates 2007 birth rates at the state level were provided by the U.S. Census Bureau. See the "Population Denominators" section of the "Technical Notes" for further information. 4. Percentages are calculated based on births, including those to mothers of unknown race. 5. Gestational diabetes is defined as glucose intolerance found during pregnancy for the first time. It excludes cases with pre-existing diabetes. 6. Adequacy of prenatal care in Massachusetts has historically been measured with the Kessner Index, based on the timing of care and number of visits. This measure is calculated based on only those births with known adequacy of prenatal care. Changes in the calculation of the Kessner Index in 1996, as well as computational adjustments made for 1996-2000 data, make data prior to 1996 non-comparable to data from 1996 onward. 7. Beginning with *Births 2001*, the APNCU Index has replaced the Kessner Index as the standard measurement of adequacy of prenatal care (see Technical Notes for more information).

Table 2. Birth Characteristics by Maternal Race and Hispanic Ethnicity and Birthplace, Massachusetts: 2007

Race and Hispanic Ethnicity (by mother's birthplace)	Births		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breastfeeding[5]	
			<18 Years		<20 Years		Very Low[2]		Low[3]		Adequate[4]		1st Trimester					
	n	%[1]	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
State Total	**77,934**	**100.0**	**1,592**	**2.0**	**4,993**	**6.4**	**1,053**	**1.4**	**6,147**	**7.9**	**63,604**	**82.8**	**63,408**	**82.0**	**26,240**	**33.7**	**60,893**	**79.2**
U.S. States/D.C.	54,631	70.1	1,271	2.3	3,948	7.2	679	1.2	4,335	7.9	45,468	84.2	45,609	84.0	18,638	34.2	40,168	74.8
Puerto Rico/U.S. Terr.[7]	2,077	2.7	138	6.6	367	17.7	48	2.3	216	10.4	1,524	74.1	1,532	74.1	639	30.8	1,487	71.9
Non-U.S.-Born[8]	21,210	27.2	183	0.9	678	3.2	320	1.5	1,590	7.5	16,609	79.8	16,262	77.7	6,960	32.9	19,235	91.2
White Non-Hispanic	**52,620**	**67.5**	**591**	**1.1**	**2,283**	**4.3**	**591**	**1.1**	**3,877**	**7.4**	**44,568**	**85.4**	**44,822**	**85.5**	**18,5**	**35.1**	**39,980**	**77.3**
U.S. States/D.C.	46,176	87.8	568	1.2	2,152	4.7	512	1.1	3,444	7.5	39,243	85.7	39,581	86.0	16,201	35.1	34,149	75.3
Puerto Rico/U.S. Terr.[7]	80	0.2	5	6.3	15	18.8	3	--[6]	13	16.3	54	67.5	63	78.8	26	32.5	67	83.8
Non-U.S.-Born[8]	6,355	12.1	18	0.3	116	1.8	72	1.1	416	6.6	5,269	83.5	5,174	81.8	2,226	35.0	5,763	91.3
Black non-Hispanic	**6,462**	**8.3**	**212**	**3.3**	**638**	**9.9**	**171**	**2.6**	**718**	**11.1**	**4,731**	**76.1**	**4,535**	**72.2**	**2,234**	**34.6**	**5,331**	**82.9**
U.S. States/D.C.	3,225	49.9	193	6.0	550	17.1	83	2.6	405	12.6	2,385	77.0	2,306	73.6	1,044	32.5	2,331	72.8
Puerto Rico/U.S. Terr.[7]	22	0.3	0	0.0	2	--[6]	1	--[6]	4	--[6]	17	77.3	21	95.5	6	28.6	18	85.7
Non-U.S.-Born[8]	3,215	49.8	19	0.6	86	2.7	87	2.7	309	9.6	2,329	75.2	2,208	70.6	1,184	36.9	2,982	93.1
Hispanic	**10,861**	**13.9**	**671**	**6.2**	**1,731**	**15.9**	**187**	**1.7**	**866**	**8.0**	**7,991**	**75.3**	**7,860**	**73.5**	**3,086**	**28.5**	**8,800**	**81.1**
U.S. States/D.C.	3,678	33.9	411	11.2	988	26.9	65	1.8	332	9.0	2,696	74.6	2,645	72.7	986	26.8	2,567	69.9
Puerto Rico/U.S. Terr.[7]	1,958	18.0	133	6.8	347	17.7	41	2.1	192	9.8	1,439	74.3	1,435	73.6	596	30.4	1,394	71.2
Non-U.S.-Born[8]	5,225	48.1	127	2.4	396	7.6	81	1.6	342	6.6	3,856	76.1	3,780	74.0	1,504	28.8	4,839	92.7
Asian	**5,758**	**7.4**	**65**	**1.1**	**181**	**3.1**	**63**	**1.1**	**488**	**8.5**	**4,657**	**81.5**	**4,537**	**79.2**	**1,733**	**30.1**	**4,938**	**86.1**
U.S. States/D.C.	746	13.0	59	7.9	148	19.8	8	1.1	72	9.7	555	75.1	517	69.9	160	21.4	573	77.2
Puerto Rico/U.S. Terr.[7]	4	--[6]	0	0.0	0	0.0	0	0.0	0	0.0	4	--[6]	4	--[6]	2	--[6]	4	--[6]
Non-U.S.-Born[8]	5,008	87.0	6	0.1	33	0.7	55	1.1	416	8.3	4,098	82.4	4,016	80.5	1,571	31.4	4,361	87.4
American Indian[9]	**121**	**0.2**	**2**	--[6]	**9**	**7.4**	**1**	--[6]	**17**	**14.0**	**95**	**81.9**	**84**	**70.6**	**47**	**38.8**	**78**	**67.2**
U.S. States/D.C.	115	95.0	2	--[6]	8	7.0	1	--[6]	15	13.0	90	81.8	79	69.9	45	39.1	75	68.2
U.S. Territories	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-U.S.-Born[8]	6	5.0	0	0.0	1	--[6]	0	0.0	2	--[6]	5	83.3	5	83.3	2	--[6]	3	--[6]
Other[10]	**2,003**	**2.6**	**51**	**2.5**	**148**	**7.4**	**36**	**1.8**	**170**	**8.5**	**1,511**	**77.6**	**1,524**	**77.3**	**673**	**33.7**	**1,719**	**88.2**
U.S. States/D.C.	611	30.5	38	6.2	99	16.2	8	1.3	60	9.8	460	77.4	446	74.1	192	31.6	438	73.7
Puerto Rico/U.S. Terr.[7]	12	0.6	0	0.0	3	--[6]	3	--[6]	7	58.3	9	75.0	8	66.7	8	66.7	3	--[6]
Non-U.S.-Born[8]	1,378	68.8	13	0.9	46	3.3	24	1.7	102	7.4	1,042	77.9	1,070	78.9	472	34.3	1,277	94.7
Unknown[11]	**109**	**0.1**	**0**	**0.0**	**3**	--[6]	**4**	**5.6**	**11**	**15.5**	**51**	**76.1**	**46**	**65.7**	**13**	**18.6**	**47**	**78.3**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. In the column "Births %", the percentages of the race/Hispanic groups (bolded) are based on the state total (including births of unknown race/ethnicity), and the birthplace percents for the race/ethnicities are based on the total number in race/Hispanic ethnicity category. For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4 Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Calculations based on 1-4 events are excluded. 7. The category "Puerto Rico/U.S. Territories" includes women born in Puerto Rico, the U.S. Virgin Islands, and Guam. Approximately 95% of the births in this category were to women born in Puerto Rico. 8. The category "Non-U.S.-Born" includes women born outside of the 50 U.S. states, District of Columbia, and Puerto Rico/U.S. territories. 9. Mothers who selected American Indian as their *race*. 10. Mothers who indicated "Other" as their race/ethnicity. 11. Mothers who did not indicate a race/ethnicity.

Table 3. Birth Characteristics by Maternal Ancestry, Massachusetts: 2007

Maternal Ancestry	Births[1]		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breast-feeding[5]		Gestational Diabetes[6]	
			<18 years		<20 Years		Very Low[2]		Low[3]		Adequate[4]		1st Trimester							
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
State Total	**77,934**	**100.0**	**1,592**	**2.0**	**4,993**	**6.4**	**1,053**	**1.4**	**6,147**	**7.9**	**63,604**	**82.8**	**63,408**	**82.0**	**26,240**	**33.7**	**60,893**	**79.2**	**3,279**	**4.2**
American	31,876	40.9	509	1.6	1,819	5.7	405	1.3	2,546	8.0	27,074	85.3	27,330	86.0	10,963	34.4	23,465	73.7	1,286	4.0
European	14,711	18.9	49	0.3	274	1.9	112	0.8	927	6.3	12,642	86.5	12,621	86.2	5,178	35.2	12,339	84.0	478	3.3
Puerto Rican	4,755	6.1	445	9.4	1,113	23.4	89	1.9	456	9.6	3,464	73.9	3,430	72.7	1,334	28.1	3,216	67.7	184	3.9
African-American	2,935	3.8	166	5.7	475	16.2	81	2.8	362	12.3	2,190	77.8	2,147	75.4	934	31.9	2,152	73.4	98	3.4
Brazilian	2,512	3.2	16	0.6	79	3.1	29	1.2	145	5.8	2,071	82.8	2,041	81.6	1,123	44.7	2,387	95.1	96	3.8
Dominican	2,010	2.6	91	4.5	262	13.0	54	2.7	152	7.6	1,509	75.9	1,528	76.7	682	34.0	1,800	89.6	63	3.1
Chinese	1,559	2.0	1	--[7]	9	0.6	15	1.0	93	6.0	1,364	87.9	1,326	85.4	445	28.6	1,400	90.0	125	8.0
African	1,477	1.9	6	0.4	26	1.8	28	1.9	117	7.9	1,090	75.9	1,003	69.3	546	37.0	1,371	93.0	98	6.6
Asian Indian	1,362	1.7	0	0.0	2	--[7]	16	1.2	119	8.8	1,117	82.3	1,128	83.1	531	39.0	1,313	96.4	127	9.3
Salvadoran	1,193	1.5	39	3.3	107	9.0	19	1.6	92	7.7	840	75.3	832	73.6	264	22.1	1,142	95.7	75	6.3
Haitian	1,155	1.5	14	1.2	39	3.4	38	3.3	144	12.5	793	73.0	761	69.1	434	37.6	1,074	93.1	78	6.8
Cape Verdean	991	1.3	30	3.0	117	11.8	15	1.5	96	9.7	687	70.5	677	69.0	293	29.6	845	85.4	27	2.7
Portuguese	952	1.2	14	1.5	78	8.2	6	0.6	69	7.3	747	78.8	781	82.3	342	36.0	540	56.9	51	5.4
South American	895	1.1	20	2.2	56	6.3	9	1.0	63	7.1	712	81.8	685	78.0	279	31.2	833	93.1	37	4.1
Guatemalan	865	1.1	29	3.4	78	9.0	5	0.6	46	5.3	614	72.5	553	64.8	188	21.8	766	88.8	20	2.3
Vietnamese	789	1.0	9	1.1	22	2.8	11	1.4	74	9.4	625	80.9	642	82.3	216	27.4	610	77.4	55	7.0
Middle Eastern	758	1.0	1	--[7]	9	1.2	6	0.8	42	5.5	598	79.8	593	78.8	249	32.9	679	89.7	31	4.1
Cambodian	666	0.9	46	6.9	116	17.4	5	0.8	86	12.9	445	66.8	378	56.8	114	17.1	383	57.5	29	4.4
Mexican	517	0.7	20	3.9	51	9.9	3	--[7]	23	4.5	359	71.2	359	70.5	153	29.6	475	92.4	30	5.8
Korean	430	0.6	1	--[7]	2	--[7]	6	1.4	31	7.2	364	84.8	373	86.7	126	29.3	397	92.3	19	4.4
Native American[8]	270	0.3	9	3.3	26	9.6	3	--[7]	26	9.7	225	83.6	194	72.1	98	36.4	184	68.4	8	3.0

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. In 2006, certain ancestry groups were combined: Lebanese, Iranian, Israeli, and Other Middle Eastern ancestries were combined into "Middle Eastern"; Colombian and Other South American were combined into "South American"; and Nigerian and Other African were combined into "African." 1. In the column "Births", percentages are based on column total (state total of births, including births for which maternal ethnicity is unknown and other). For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Gestational diabetes is defined as glucose intolerance found during pregnancy for the first time. It excludes cases with pre-existing diabetes. 7. Calculations based on 1-4 events are excluded. 8. Mothers who selected Native American as their *ancestry*.

Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2007

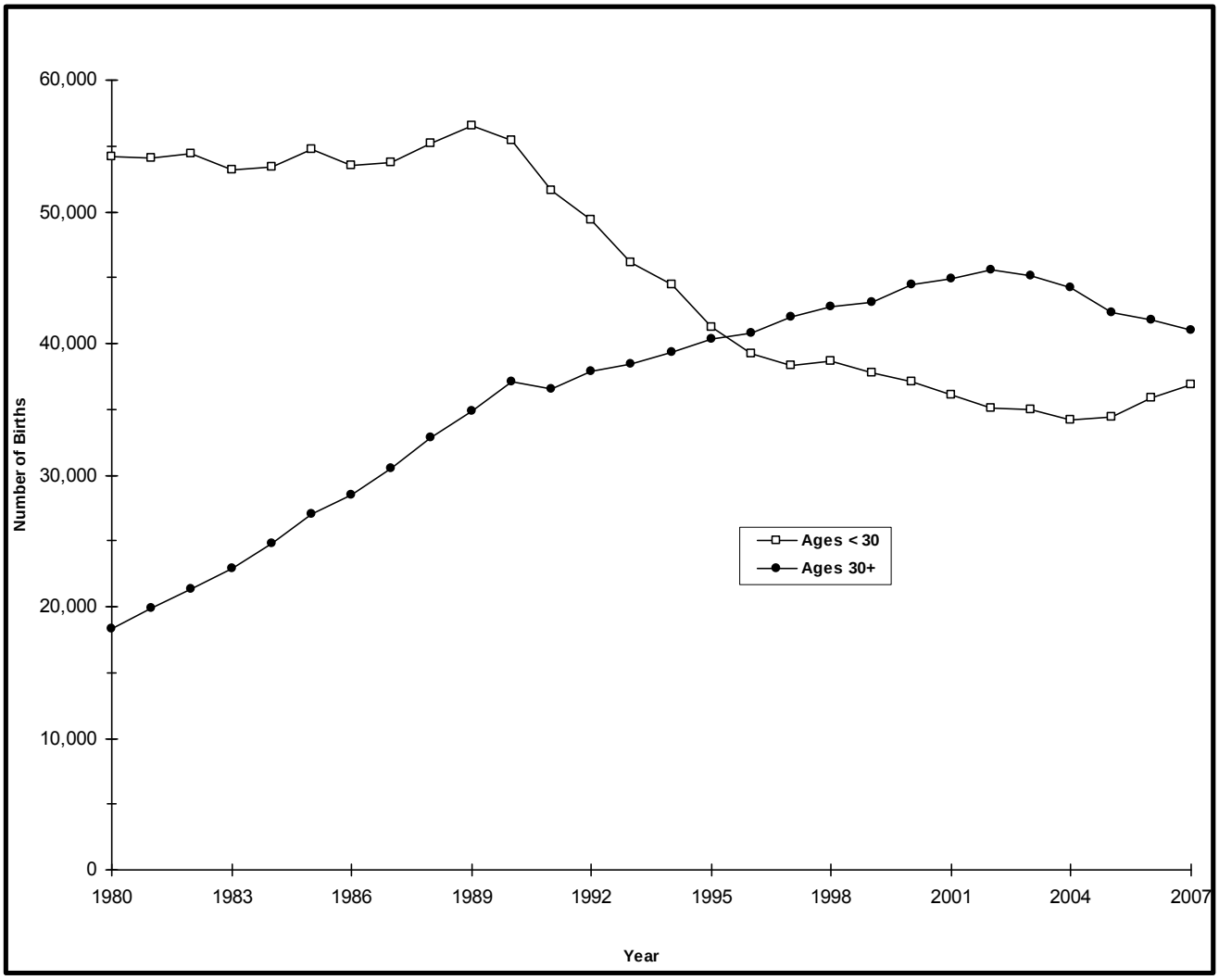


Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2007

	1990		2007		
Mother's Age	**Births[1]**	**Rate**	**Births**	**Rate[2]**	**Percent Change in Rate**
10-14	124	1.3	49	0.2	-84.6%
15-19	7,259	35.1	4,944	22.3	-36.5%
20-24	18,115	69.5	12,598	55.9	-19.6%
25-29	29,913	107.2	19,283	93.1	-13.2%
30-34	25,687	93.9	23,334	112.4	19.7%
35-39	9,795	40.1	14,336	59.7	48.9%
40-44	1,522	6.9	3,151	11.9	72.5%
45+[3]	46	0.3	223	0.8	166.7%
Birth Rate (ages 15-44[4])	92,290	62.2	77,646	57.2	-8.0%
Crude Birth Rate[5]	92,461	15.4	77,934	12.1	-21.4%

NOTE: All percentages are calculated based on only births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Differences in the number of births from previous publications are the result of updated birth files. The number of births for all age groups does not always add to the total number of births because mother's age is sometimes not recorded on the birth certificate.
2. Population estimates from the National Center for Health Statistics for 2007 were used to calculate birth rates at the state level.
3. Denominator is the female population ages 45-49.
4. Rate represents the total number of births to women ages 15-44 per 1,000 women in the population ages 15 to 44.
5. Births per 1,000 residents (male and female). Includes births to mothers of all age groups and mothers for whom age is unknown.

Table 5. Trends in Number and Percent Distribution of Births[1] by Plurality and Age Massachusetts: 1994-2007

Age Group	Year	Singletons		Multiples[2]						Total births	
				Twins		Triplets or more		Total Multiples			
		n	%	n	%	n	%	n	%	n	%
All Ages											
	1994	81,187	96.9	2,357	2.8	214	0.3	2,571	3.1	83,758	100.0
	1995	78,935	96.8	2,429	3.0	198	0.2	2,627	3.2	81,562	100.0
	1996	77,355	96.5	2,621	3.3	194	0.2	2,815	3.5	80,164	100.0
	1997	77,203	96.1	2,856	3.6	262	0.3	3,118	3.9	80,321	100.0
	1998	78,004	95.8	3,114	3.8	288	0.4	3,402	4.2	81,406	100.0
	1999	77,473	95.8	3,147	3.9	246	0.3	3,393	4.2	80,866	100.0
	2000	78,075	95.7	3,263	4.0	244	0.3	3,507	4.3	81,582	100.0
	2001	77,409	95.6	3,371	4.2	234	0.3	3,605	4.4	81,014	100.0
	2002	76,673	95.1	3,708	4.6	243	0.3	3,951	4.9	80,624	100.0
	2003	76,367	95.3	3,551	4.4	249	0.3	3,800	4.7	80,167	100.0
	2004	74,677	95.2	3,538	4.5	245	0.3	3,783	4.8	78,460	100.0
	2005	73,258	95.4	3,375	4.4	190	0.2	3,565	4.6	76,824	100.0
	2006	74,146	95.5	3,375	4.3	149	0.2	3,524	4.5	77,670	100.0
	2007	**74,498**	**95.6**	**3,310**	**4.2**	**126**	**0.2**	**3,436**	**4.4**	**77,934**	**100.0**
Ages <35											
	1994	68,644	97.2	1,844	2.6	164	0.2	2,008	2.8	70,652	100.0
	1995	65,669	97.2	1,787	2.6	141	0.2	1,928	2.9	67,597	100.0
	1996	63,560	96.9	1,935	2.9	126	0.2	2,061	3.1	65,621	100.0
	1997	62,598	96.7	1,949	3.0	170	0.3	2,119	3.3	64,717	100.0
	1998	62,719	96.4	2,193	3.4	170	0.3	2,363	3.6	65,082	100.0
	1999	61,816	96.4	2,147	3.3	150	0.2	2,297	3.6	64,113	100.0
	2000	61,659	96.4	2,205	3.4	130	0.2	2,335	3.6	63,994	100.0
	2001	60,704	96.3	2,211	3.5	134	0.2	2,345	3.7	63,049	100.0
	2002	59,736	96.0	2,379	3.8	127	0.2	2,506	4.0	62,242	100.0
	2003	59,347	95.9	2,389	3.9	118	0.2	2,507	4.1	61,854	100.0
	2004	57,618	96.0	2,229	3.7	142	0.2	2,371	4.0	59,989	100.0
	2005	56,380	96.3	2,086	3.6	102	0.2	2,188	3.7	58,569	100.0
	2006	57,237	96.3	2,116	3.6	89	0.1	2,205	3.7	59,442	100.0
	2007	**57,977**	**96.3**	**2,144**	**3.6**	**87**	**0.1**	**2,231**	**3.7**	**60,208**	**100.0**
Ages 35+											
	1994	12,543	95.7	513	3.9	50	0.4	563	4.3	13,106	100.0
	1995	13,264	95.0	642	4.6	57	0.4	699	5.0	13,963	100.0
	1996	13,793	94.8	686	4.7	68	0.5	754	5.2	14,547	100.0
	1997	14,602	93.6	907	5.8	92	0.6	999	6.4	15,601	100.0
	1998	15,282	93.6	921	5.6	118	0.7	1,039	6.4	16,321	100.0
	1999	15,657	93.5	1,000	6.0	96	0.6	1,096	6.5	16,753	100.0
	2000	16,412	93.3	1,058	6.0	114	0.6	1,172	6.7	17,584	100.0
	2001	16,703	93.0	1,160	6.5	100	0.6	1,260	7.0	17,963	100.0
	2002	16,936	92.1	1,329	7.2	116	0.6	1,445	7.9	18,381	100.0
	2003	17,015	92.9	1,162	6.3	131	0.7	1,293	7.1	18,308	100.0
	2004	17,055	92.4	1,309	7.1	103	0.6	1,412	7.6	18,467	100.0
	2005	16,874	92.5	1,289	7.1	88	0.5	1,377	7.5	18,251	100.0
	2006	16,901	92.8	1,257	6.9	60	0.3	1,317	7.2	18,218	100.0
	2007	**16,519**	**93.2**	**1,166**	**6.6**	**39**	**0.2**	**1,205**	**6.8**	**17,724**	**100.0**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. 1. Differences in the number of births from previous publications are the result of updated files. 2. Numbers of multiples (n) represent individual infants rather than sets of infants.

Table 6. Summary of Selected Teen Birth Characteristics, Massachusetts: 2007

	Ages 15-17		Ages 18-19		Combined Ages 15-19	
	N	%[1]	N	%[1]	N	%[1]
State total	1,543	31.2%	3,401	68.8%	4,944	100.0%
Maternal Demographics						
Race/Hispanic Ethnicity	N	%[2]	N	%[2]	N	%[2]
White non-Hispanic	582	37.7%	1,692	49.8%	2,274	46.0%
Black non-Hispanic	201	13.0%	426	12.5%	627	12.7%
Asian	61	4.0%	116	3.4%	177	3.6%
Hispanic	646	41.9%	1,060	31.2%	1,706	34.5%
Other	53	3.4%	104	3.1%	157	3.2%
Birthplace						
U.S. States / D.C.	1,236	80.1%	2,677	78.7%	3,913	79.1%
Puerto Rico / US Terr.	134	8.7%	229	6.7%	363	7.3%
Non-U.S.-born	173	11.2%	495	14.6%	668	13.5%
Prenatal care funding						
Public	1,144	75.8%	2,587	76.9%	3,731	76.6%
Private, other	366	24.2%	775	23.1%	1,141	23.4%
Pregnancy-Related Factors						
Adequacy of Prenatal Care[3]						
Adequate Total[4]	999	66.6%	2,359	70.5%	3,358	69.3%
Adequate Intensive	456	30.4%	1,076	32.1%	1,532	31.6%
Adequate Basic	543	36.2%	1,283	38.3%	1,826	37.7%
Intermediate	160	10.7%	364	10.9%	524	10.8%
Inadequate/None	340	22.7%	624	18.6%	964	19.9%
Unknown	44	2.9%	54	1.6%	98	2.0%
Parity[6]						
1	1,448	94.0%	2,829	83.3%	4,277	86.6%
2	89	5.8%	499	14.7%	588	11.9%
3+	3	--[5]	70	2.1%	73	1.5%
Smoking during Pregnancy						
Yes	147	9.5%	539	15.9%	686	13.9%
No	1,394	90.5%	2,858	84.1%	4,252	86.1%
Birth Outcomes						
Birthweight						
< 500 g	4	--[5]	7	0.2%	11	0.2%
500-1,499 g	28	1.8%	56	1.6%	84	1.7%
1,500-2,499 g	148	9.6%	255	7.5%	403	8.2%
LBW (<2,499 g)	180	11.7%	318	9%	498	10.1%
2,500-3,999 g	1,294	83.9%	2,875	84.6%	4,169	84.3%
4000+ g	69	4.5%	207	6.1%	276	5.6%
Gestational age						
< 28 weeks	21	1.4%	29	0.9%	50	1.0%
< 37 weeks	173	11.2%	315	9.3%	488	9.9%
37-42 weeks	1,368	88.8%	3,082	90.7%	4,450	90.1%
43+ weeks	0	0.0%	1	--[5]	1	--[5]
Plurality						
Singleton	1,511	97.9%	3,335	98.1%	4,846	98.0%
Multiple birth	32	2.1%	66	1.9%	98	2.0%

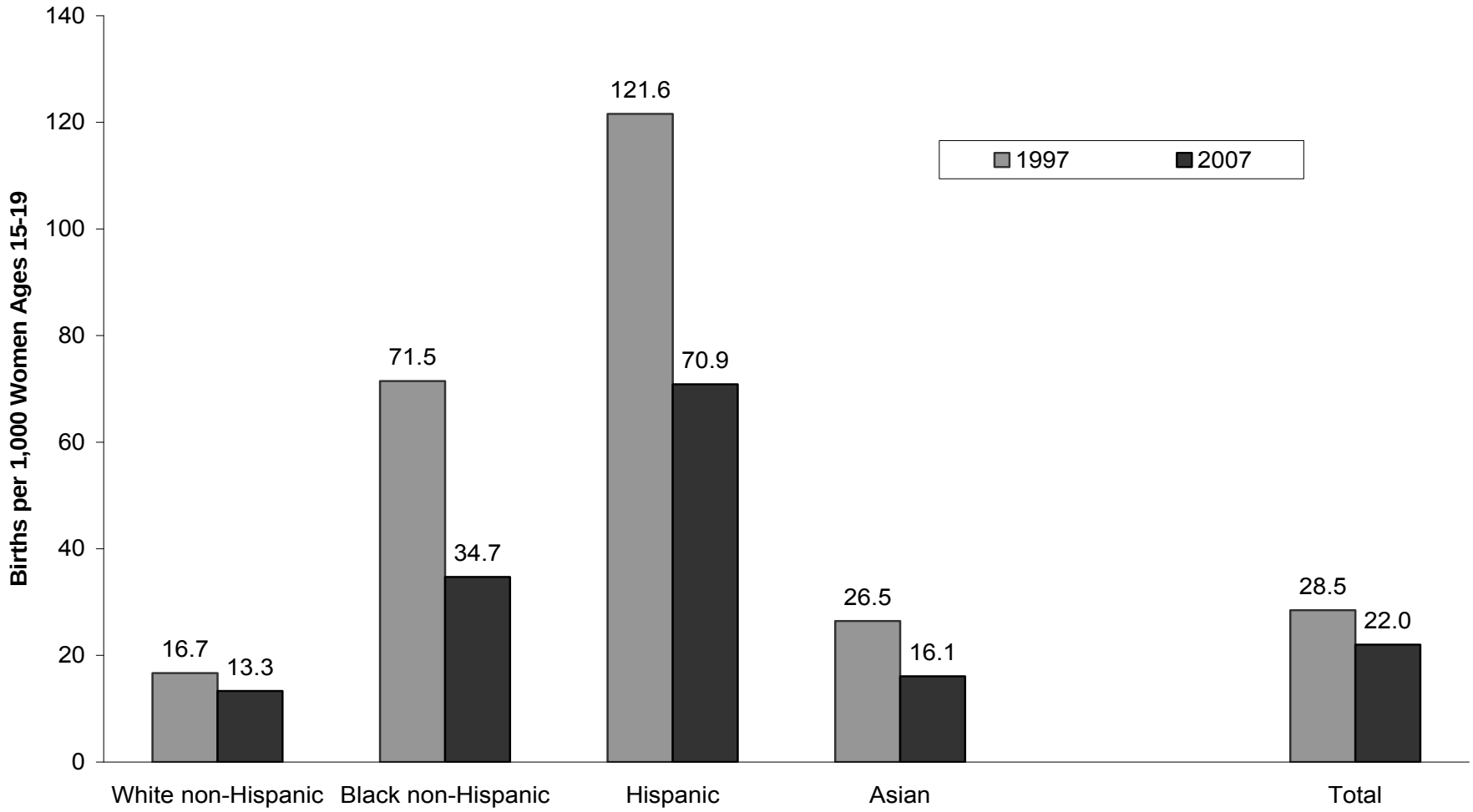
NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. For state total row, percentages are based on total births to women ages 15-19. For the rest of the table, percentages are based on births for a given age group and characteristic. 2. Percents are based on state total of the age group. 3. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 4. Adequate Total = Adequate Basic + Adequate Intensive. 5. Calculations based 1-4 events are excluded. 6. Number of live births including the current birth.

Table 7. Trends in Teen Birth Rates for Selected Communities[1], Ranked by 2007 Teen Birth Rate[2], Massachusetts: 1997, 2006, and 2007

2007 Rank	Municipality	1997[3]		2006		2007	
		Number of Teen Births	Teen Birth Rate	Number of Teen Births	Teen Birth Rate	Number of Teen Births	Teen Birth Rate[4]
	State Total	**5,801**	**28.5**	**4,722**	**21.3**	**4,944**	**22.0**
1	Holyoke	180	125.1	143	94.8	144	95.4
2	Springfield	476	87.4	490	80.7	512	84.3
3	Chelsea	92	106.2	79	79.0	82	82.0
4	Southbridge	48	87.4	36	64.5	43	77.1
5	Lawrence	277	105.4	244	80.6	230	76.0
6	New Bedford	221	72.8	207	70.0	197	66.7
7	Fall River	141	51.3	146	51.6	167	59.0
8	Lynn	182	72.6	147	47.7	175	56.7
9	Lowell	276	76.0	202	50.9	215	54.2
10	Pittsfield	58	40.6	63	49.6	67	52.7
11	Brockton	196	72.4	156	42.9	171	47.0
12	Revere	46	39.9	39	37.0	48	45.6
13	Fitchburg	88	53.6	91	58.2	71	45.4
14	Chicopee	63	35.5	58	33.4	76	43.7
15	Everett	26	27.8	37	34.9	43	40.6
16	Leominster	43	38.2	38	30.3	46	36.7
17	Worcester	313	48.8	242	34.4	251	35.7
18	Haverhill	87	55.2	73	38.3	67	35.1
19	Taunton	70	45.5	53	32.5	55	33.7
20	Attleboro	36	31.3	27	23.8	35	30.9
21	Boston	825	44.9	568	28.7	588	29.7
22	Methuen	47	36.4	29	21.9	39	29.4
23	Malden	33	28.9	28	19.6	37	25.9
24	Framingham	61	31.8	65	33.3	40	20.5
25	Quincy	38	19.1	22	10.6	38	18.3

1. Selected communities include the 25 Massachusetts cities and towns with the greatest number of teen births. Ranking is by 2007 teen birth rate. 2. Rates are per 1,000 females ages 15-19 per city/town. 3. Source for 1997 births and rates: Massachusetts Community Health Information Profile (MassCHIP), MDPH, v3.0 r321, October 2008; natality dataset and MISER 1997 population estimate. 4. Population estimates from the National Center for Health Statistics for 2007 were used to calculate birth rates at the state level. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. Please note: If the population in your community increased from 2005 to 2007, the rates listed may overestimate the actual rate. If the population in your community declined from 2005 to 2007, the rates given in the publication may underestimate the actual rate. As soon as new population data are available for cities and towns, revised rates will be available from MassCHIP http://masschip.state.ma.us.

Figure 2. Birth Rates among Women Ages 15-19 by Mother's Race and Hispanic Ethnicity, Massachusetts: 1997 and 2007



Teen birth rate is number of births to women ages 15-19 per 1,000 women ages 15-19.
Denominators for 1997 state rates are based on the 1997 MISER Population Estimates. 2007 birth rates are based on the 2007 population estimates from the National Center for Health Statistics.

Table 8. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2007

Birthweight (in grams)	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other		Unknown race/ethnicity
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n
State Total	**77,934**	**100.0**	**52,620**	**100.0**	**6,462**	**100.0**	**10,861**	**100.0**	**5,758**	**100.0**	**2,124**	**100.0**	**109**
<500	115	0.1	61	0.1	25	0.4	19	0.2	8	0.1	2	--[2]	0
500-999	395	0.5	209	0.4	68	1.1	72	0.7	22	0.4	21	1.0	3
1,000-1,499	543	0.7	321	0.6	78	1.2	96	0.9	33	0.6	14	0.7	1
1,500-1,999	1,221	1.6	811	1.5	135	2.1	146	1.3	83	1.4	44	2.1	2
2,000-2,499	3,873	5.0	2,475	4.7	412	6.4	533	4.9	342	5.9	106	5.0	5
2,500-2,999	12,783	16.4	7,756	14.7	1,344	20.8	2,040	18.8	1,232	21.4	404	19.0	7
3,000-3,499	29,209	37.5	18,998	36.1	2,546	39.4	4,344	40.0	2,494	43.3	805	37.9	22
3,500-3,999	22,319	28.6	16,220	30.8	1,454	22.5	2,812	25.9	1,253	21.8	556	26.2	24
4,000-4,499	6,298	8.1	4,893	9.3	335	5.2	672	6.2	250	4.3	142	6.7	6
4,500-4,999	943	1.2	737	1.4	52	0.8	97	0.9	28	0.5	28	1.3	1
>=5,000	130	0.2	93	0.2	9	0.1	18	0.2	8	0.1	2	--[2]	0
Unknown birthweight	105	0.1	46	0.1	4	--[2]	12	0.1	5	0.1	0	0.0	38
VLBW[3] (0-1,499 g)	1,053	1.4	591	1.1	171	2.6	187	1.7	63	1.1	37	1.7	4
LBW[4] (0-2,499 g)	6,147	7.9	3,877	7.4	718	11.1	866	8.0	488	8.5	187	8.8	11

NOTE: Percentages for detailed birthweight rows ("<500" through "Unknown birthweight") are calculated based on births including those with unknown birthweight. Percentages for VLBW and LBW rows are calculated based on births with known birthweight only.

1. Percentages are based on column totals. 2. Calculations based on values of 1-4 are excluded. 3. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.). 4. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

Table 9. Low Birthweight by Plurality and Maternal Age, Massachusetts: 1997-2007

Age Group (years)	Year	Singleton				Multiples												Total Births			
						Twin				Triplets or more				Total Multiples							
		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
All Ages	**1997**	731	0.9	3,938	5.1	292	10.3	1,439	50.5	75	28.6	240	91.6	367	11.8	1,679	54.0	1,098	1.4	5,617	7.0
	1998	690	0.9	3,819	4.9	298	9.6	1,570	50.7	82	28.5	266	92.4	380	11.2	1,836	54.2	1,070	1.3	5,655	7.0
	1999	731	0.9	3,869	5.0	324	10.3	1,617	51.6	65	26.5	222	90.6	389	11.5	1,839	54.5	1,120	1.4	5,708	7.1
	2000	722	0.9	3,886	5.1	284	8.9	1,603	50.0	84	35.0	222	92.5	368	10.7	1,825	53.0	1,090	1.4	5,711	7.1
	2001	730	0.9	3,931	5.1	310	9.2	1,654	49.2	74	32.9	210	93.3	384	10.7	1,864	52.0	1,114	1.4	5,795	7.2
	2002	699	0.9	3,972	5.2	342	9.2	1,855	50.2	68	28.0	233	95.9	410	10.4	2,088	53.0	1,109	1.4	6,060	7.5
	2003	713	0.9	4,006	5.3	331	9.3	1,877	52.9	71	28.5	232	93.2	402	10.6	2,109	55.6	1,115	1.4	6,115	7.6
	2004	740	1.0	4,015	5.4	324	9.2	1,879	53.2	84	34.4	231	94.7	408	10.8	2,110	55.9	1,148	1.5	6,125	7.8
	2005	701	1.0	4,126	5.6	322	9.5	1,765	52.3	75	39.5	181	95.3	397	11.1	1,946	54.6	1,098	1.4	6,072	7.9
	2006	687	0.9	4,264	5.8	308	9.1	1,746	51.8	46	31.1	140	94.6	354	10.1	1,886	53.6	1,041	1.3	6,150	7.9
	2007	693	0.9	4,258	5.7	306	9.2	1,772	53.6	54	42.9	117	92.9	360	10.5	1,889	55.0	1,053	1.4	6,147	7.9
Ages < 35	**1997**	566	0.9	3,179	5.1	214	11.0	1,030	53.0	46	27.1	153	90.0	260	12.3	1,183	55.9	826	1.3	4,362	6.8
	1998	540	0.9	3,086	4.9	248	11.4	1,148	52.5	60	35.3	153	90.0	308	13.1	1,301	55.2	848	1.3	4,387	6.8
	1999	569	0.9	3,082	5.0	231	10.8	1,124	52.6	49	32.9	138	92.6	280	12.3	1,262	55.2	849	1.3	4,344	6.8
	2000	555	0.9	3,096	5.1	204	9.4	1,097	50.7	49	38.0	125	96.9	253	11.0	1,222	53.3	808	1.3	4,318	6.9
	2001	576	1.0	3,147	5.2	235	10.7	1,156	52.4	41	31.3	120	91.6	276	11.8	1,276	54.6	852	1.4	4,423	7.0
	2002	537	0.9	3,129	5.2	237	10.0	1,229	51.9	42	33.1	125	98.4	279	11.2	1,354	54.2	816	1.3	4,483	7.2
	2003	539	0.9	3,161	5.3	256	10.7	1,325	55.5	38	32.2	114	96.6	294	11.7	1,439	57.5	833	1.3	4,600	7.5
	2004	565	1.0	3,128	5.4	207	9.3	1,224	55.0	56	39.7	133	94.3	263	11.1	1,357	57.3	828	1.4	4,485	7.5
	2005	552	1.0	3,198	5.7	215	10.3	1,149	55.1	47	46.1	100	98.0	262	12.0	1,249	57.1	814	1.4	4,447	7.6
	2006	534	0.9	3,342	5.8	217	10.3	1,157	54.8	28	31.5	83	93.3	245	11.1	1,240	56.3	779	1.3	4,582	7.7
	2007	533	0.9	3,317	5.7	223	10.4	1,191	55.6	45	51.7	85	97.7	268	12.0	1,276	57.2	801	1.3	4,593	7.6
Ages 35+	**1997**	165	1.1	759	5.2	78	8.6	409	45.3	29	31.5	87	94.6	107	10.8	496	49.9	272	1.7	1,255	8.1
	1998	150	1.0	733	4.8	50	5.5	422	46.2	22	18.6	113	95.8	72	7.0	535	51.8	222	1.4	1,268	7.8
	1999	162	1.0	787	5.0	93	9.3	493	49.5	16	16.7	84	87.5	109	10.0	577	52.8	271	1.6	1,364	8.2
	2000	167	1.0	790	4.9	80	7.7	506	48.6	35	31.5	97	87.4	115	10.0	603	52.3	282	1.6	1,393	8.1
	2001	154	0.9	784	4.7	75	6.5	498	43.2	33	35.1	90	95.7	108	8.7	588	47.2	262	1.5	1,372	7.7
	2002	161	1.0	842	5.0	105	7.9	626	47.1	26	22.4	108	93.1	131	9.1	734	50.8	292	1.6	1,576	8.6
	2003	174	1.0	844	5.0	75	6.5	552	47.5	33	25.2	118	90.1	108	8.4	670	51.9	282	1.5	1,514	8.3
	2004	174	1.0	886	5.2	117	9.0	655	50.2	28	27.2	98	95.1	145	10.3	753	53.5	319	1.7	1,639	8.9
	2005	149	0.9	927	5.5	107	8.3	616	47.8	28	31.8	81	92.0	135	9.8	697	50.6	284	1.6	1,624	8.9
	2006	151	0.9	919	5.4	89	7.1	587	46.8	18	30.5	57	96.6	107	8.1	644	49.0	258	1.4	1,563	8.6
	2007	160	1.0	941	5.7	83	7.1	581	49.8	9	23.1	32	82.1	92	7.6	613	50.9	252	1.4	1,554	8.8

NOTE: Very Low Birthweight (VLBW) births are a subset of Low Birthweight (LBW) births. All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. 1. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.). 2. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

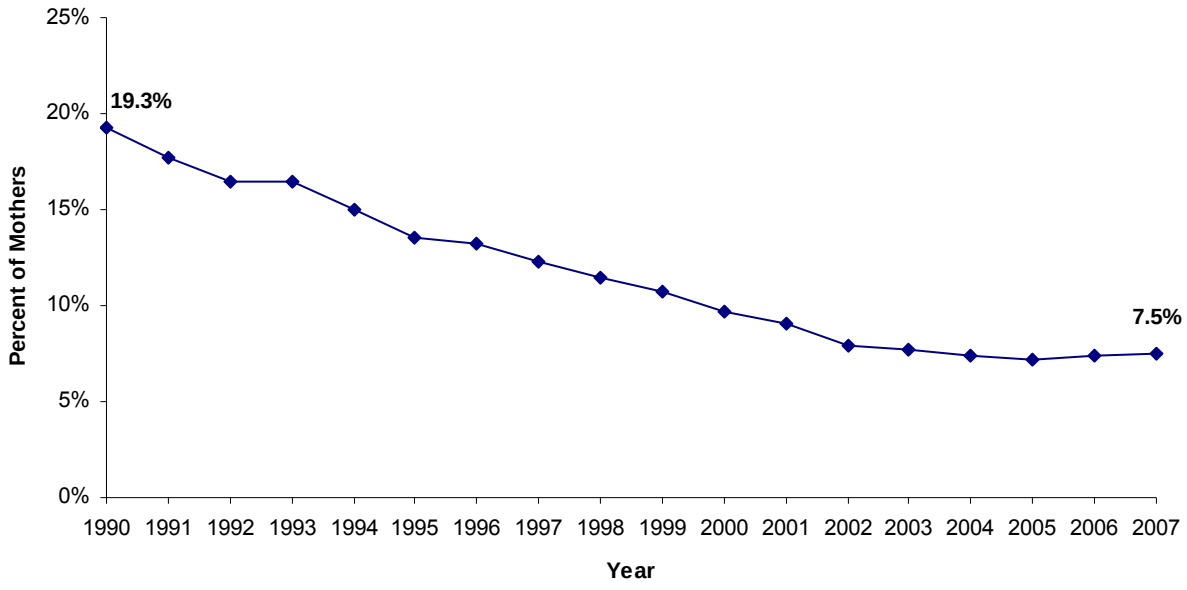
Table 10. Births by Gestational Age[1], Race and Hispanic Ethnicity, Massachusetts: 2007

Gestational Age[4]	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[3]		Unknown
(weeks completed)	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n
State Total	**77,934**	**100.0**	**52,620**	**100.0**	**6,462**	**100.0**	**10,861**	**100.0**	**5,758**	**100.0**	**2,124**	**100.0**	**109**
<20	21	0.0	10	0.0	7	0.1	1	--[8]	2	--[8]	1	--[8]	0
20-23	125	0.2	64	0.1	24	0.4	24	0.2	7	0.1	4	--[8]	2
24-27	334	0.4	174	0.3	63	1.0	67	0.6	18	0.3	11	0.5	1
28-31	689	0.9	410	0.8	91	1.4	113	1.0	47	0.8	25	1.2	3
32-35	3,211	4.1	2,234	4.2	296	4.6	391	3.6	190	3.3	97	4.6	3
36	2,600	3.3	1,762	3.3	234	3.6	356	3.3	188	3.3	57	2.7	3
37-39	39,056	50.1	26,191	49.8	3,178	49.2	5,522	50.8	3,102	53.9	1,039	48.9	24
40	23,231	29.8	15,672	29.8	1,963	30.4	3,264	30.1	1,647	28.6	664	31.3	21
41	8,029	10.3	5,711	10.9	548	8.5	1,019	9.4	527	9.2	211	9.9	13
42	521	0.7	334	0.6	51	0.8	92	0.8	28	0.5	15	0.7	1
43	14	0.0	8	0.0	2	--[8]	4	--[8]	0	0.0	0	0.0	0
44+	2	--[8]	2	--[8]	0	0.0	0	0.0	0	0.0	0	0.0	0
Unknown[5]	101	0.1	48	0.1	5	0.1	8	0.1	2	--[8]	0	0.0	38
Very early gestation, <28 weeks[6]	480	0.6	248	0.5	94	1.5	92	0.8	27	0.5	16	0.8	3
Late Preterm 34-36 weeks	4,945	6.4	3,407	6.5	440	6.8	640	5.9	320	5.6	132	6.2	6
Preterm, <37 weeks[7]	6,980	9.0	4,654	8.9	715	11.1	952	8.8	452	7.9	195	9.2	12

NOTE: Percentages for detailed gestational age category rows ("<20" through "Unknown") are calculated based on births including those with unknown gestational age. Percentages for "Very early gestation" and "Preterm" rows are calculated based on births with known gestational age only.

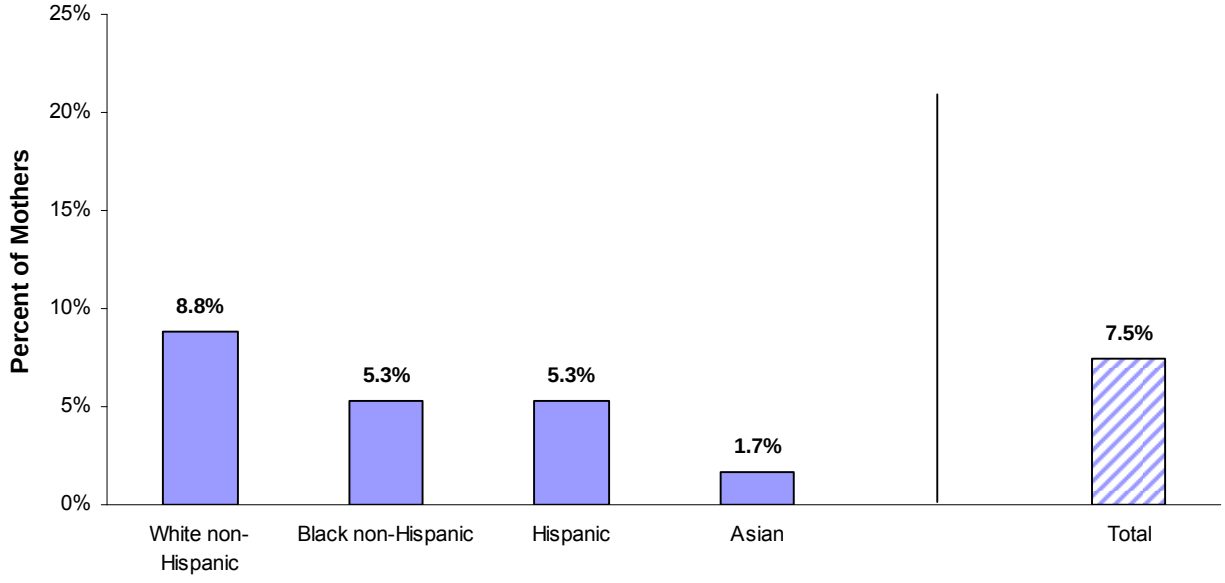
1. A clinical estimate of the number of weeks of pregnancy completed; as estimated by the attendant at birth or the postnatal physician. 2. Percentages are based on column total. 3. Other races include American Indian and others not specified. 4. Normal gestational age is defined as 37-42 weeks. 5. Estimate of gestational age not provided. 6. Also known as extremely premature delivery, or extremely preterm delivery. 7. Also known as early gestational age, premature delivery, or preterm delivery. 8. Calculations based on values of 1-4 are excluded.

Figure 3. Percent of Mothers who Smoked During Pregnancy[1], Massachusetts: 1990-2007



1. Based on information provided on the birth certificate as reported by the mother. Due to self-reported nature, data on smoking prevalence should be interpreted cautiously. Mothers with more than one delivery are counted for each birth.

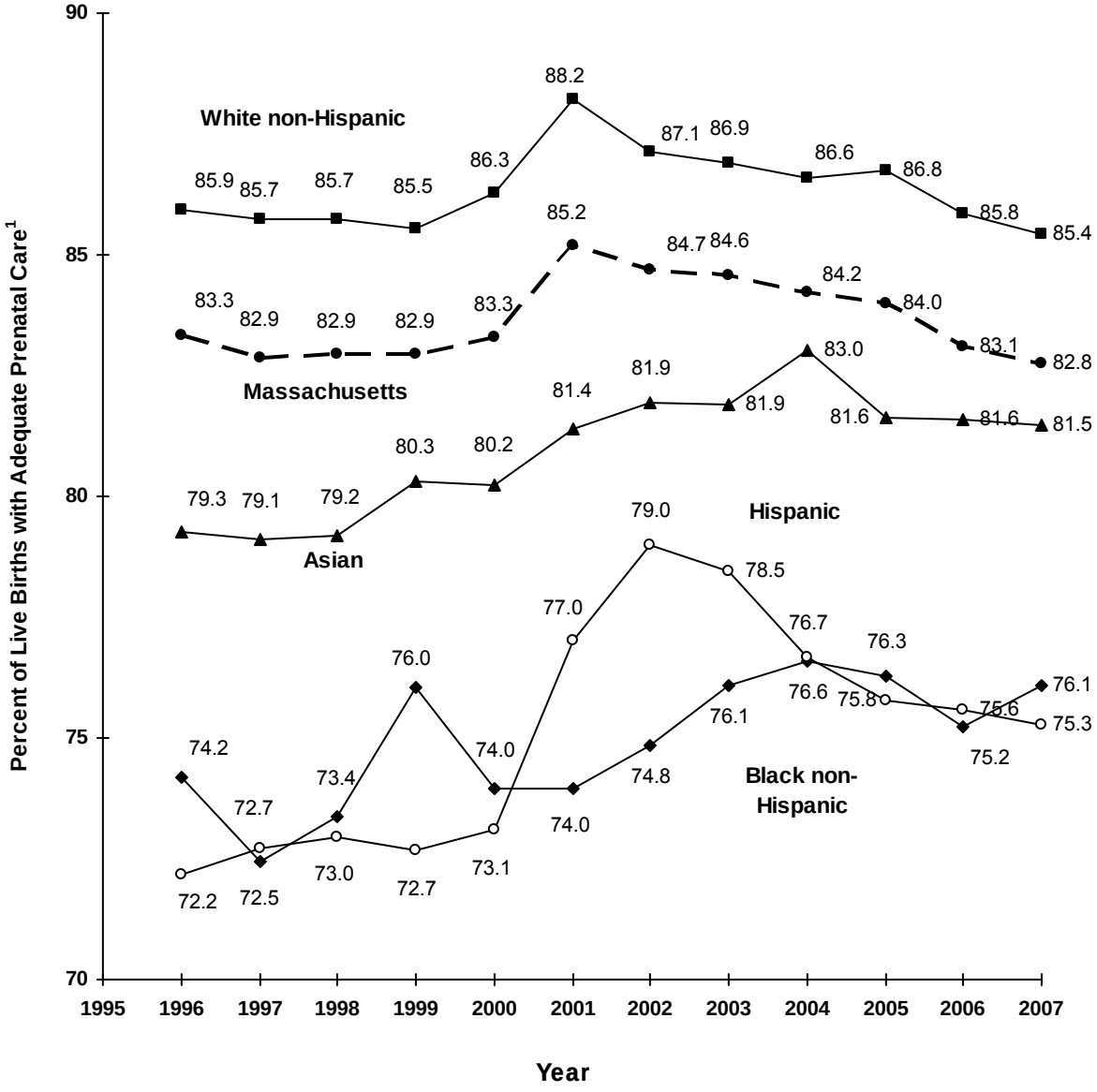
Figure 4. Percent of Mothers who Reported Smoking During Pregnancy[1] by Mother's Race and Hispanic Ethnicity, Massachusetts: 2007



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on information provided on the birth certificate as reported by the mother. Due to self-reported nature, data on smoking prevalence should be interpreted cautiously. Mothers with more than one delivery are counted for each birth. 2. Caution should be used with Asian data because of small numbers.

Figure 5. Trends in Adequacy of Prenatal Care[1] by Race and Hispanic Ethnicity, Massachusetts: 1996-2007

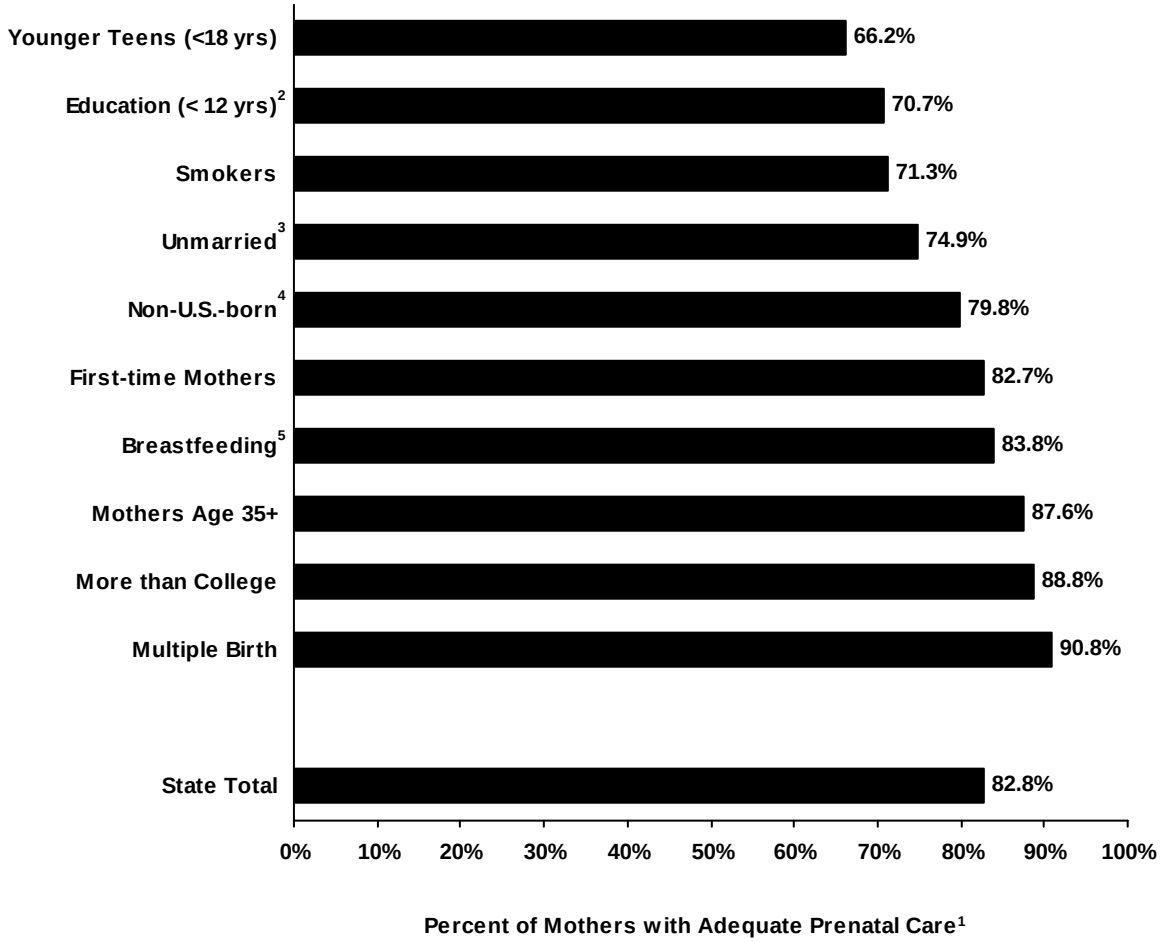


PLEASE NOTE THAT THE VERTICAL SCALE OF GRAPH REPRESENTS A SMALL INTERVAL (from 70% to 90%) FOR PURPOSES OF VISUAL REPRESENTATION.

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please note: The APNCU is an assessment of the timing and number of prenatal care visits and not an evaluation of the quality of care delivered.

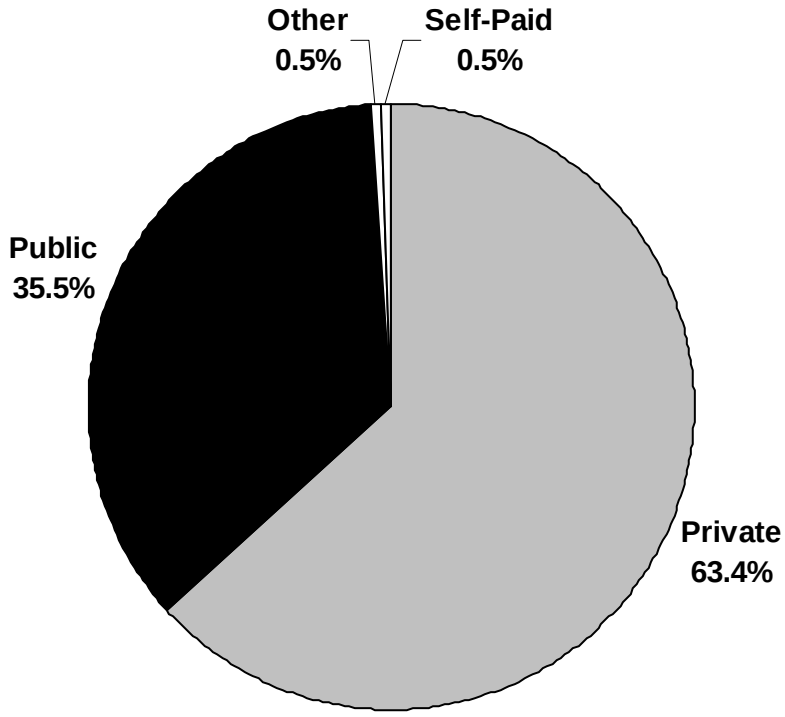
Figure 6. Adequacy of Prenatal Care[1] by Selected Maternal Characteristics, Massachusetts: 2007



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Characteristics of interest are not mutually exclusive, except as noted.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 2. Women 20 years of age and older. 3. Marital status at time of birth. 4. Non-U.S.-born includes women born outside of the 50 U.S. states, District of Columbia, and U.S. territories (Puerto Rico, U.S. Virgin Islands, Guam). 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

Figure 7. Distribution of Prenatal Care Payment Source[1], Massachusetts: 2007



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Private: Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance. Public: Government programs including Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may also be HMO or managed care), or free care. Other: Worker's Compensation and other sources.

Table 11. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race and Hispanic Ethnicity, Massachusetts: 1990-2007

INFANT MORTALITY (less than one year of age)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1990	649	7.0	442	6.1	98	13.7	77	9.1	24	7.0	8	9.5
1991	577	6.5	381	5.5	101	15.0	80	9.4	14	4.2	1	--[4]
1992	569	6.5	371	5.5	110	16.4	67	7.9	16	4.9	5	5.1
1993	523	6.2	346	5.3	84	13.1	77	9.3	13	3.9	3	--[4]
1994	499	6.0	343	5.3	79	12.6	64	7.6	8	2.4	5	5.3
1995	419	5.1	275	4.4	65	11.1	58	7.2	19	5.5	2	--[4]
1996	403	5.0	289	4.7	63	11.4	40	5.1	8	2.2	2	--[4]
1997	425	5.3	294	4.8	64	11.7	55	6.7	10	2.6	2	--[4]
1998	414	5.1	287	4.6	59	10.6	58	6.7	10	2.7	0	0.0
1999	418	5.2	285	4.7	72	12.3	49	5.5	8	1.9	4	--[4]
2000	377	4.6	232	3.8	74	12.8	48	5.2	19	4.1	4	--[4]
2001	407	5.0	245	4.1	71	12.1	69	7.3	15	3.1	7	4.1
2002	397	4.9	239	4.1	69	11.6	67	7.0	16	3.0	6	3.8
2003	383	4.8	235	4.1	75	12.7	55	5.6	14	2.7	4	--[4]
2004	376	4.8	210	3.8	70	11.5	75	7.6	15	2.7	6	3.5
2005	391	5.1	230	4.3	57	9.4	78	7.7	18	3.4	8	4.3
2006	369	4.8	221	4.2	72	11.1	62	5.8	10	1.8	3	--[4]
2007	380	4.9	206	3.9	66	10.2	81	7.4	18	3.1	4	--[4]

NEONATAL MORTALITY (birth to 27 days)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1990	446	4.8	298	4.1	75	10.5	49	5.8	19	5.5	5	5.5
1991	401	4.5	266	3.9	72	10.7	53	6.2	10	3.0	0	0.0
1992	415	4.8	274	4.0	76	11.4	51	6.0	10	3.0	4	--[4]
1993	375	4.4	245	3.7	64	10.0	55	6.7	9	2.7	2	--[4]
1994	349	4.2	240	3.7	58	9.3	40	4.7	7	2.1	4	--[4]
1995	298	3.6	198	3.1	50	8.5	39	4.8	10	2.9	1	--[4]
1996	290	3.6	222	3.6	34	6.2	27	3.5	5	1.4	1	--[4]
1997	323	4.0	228	3.7	44	8.0	43	5.2	7	1.8	1	--[4]
1998	315	3.9	218	3.5	47	8.5	43	5.0	7	1.9	0	0.0
1999	332	4.1	226	3.7	58	9.9	39	4.4	5	1.2	4	--[4]
2000	288	3.5	177	2.9	57	9.9	37	4.0	14	3.0	3	--[4]
2001	308	3.8	190	3.2	56	9.5	49	5.2	10	2.1	3	--[4]
2002	299	3.7	185	3.2	49	8.2	50	5.2	13	2.4	2	--[4]
2003	285	3.6	179	3.1	56	9.5	38	3.9	10	1.9	2	--[4]
2004	291	3.7	167	3.0	51	8.4	57	5.8	12	2.2	4	--[4]
2005	282	3.7	168	3.1	40	6.6	57	5.8	11	2.1	5	2.7
2006	279	3.6	173	3.3	53	8.2	42	3.9	7	1.3	3	--[4]
2007	263	3.4	141	2.7	48	7.4	53	4.9	15	2.6	4	--[4]

Table 11 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race and Hispanic Ethnicity, Massachusetts: 1990-2007

POST NEONATAL MORTALITY (28-364 days)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**
1990	**203**	**2.2**	**144**	**2.0**	**23**	**3.2**	**28**	**3.3**	**5**	**1.5**	**3**	--[4]
1991	176	2.0	115	1.7	29	4.3	27	3.2	4	--[4]	1	--[4]
1992	154	1.8	97	1.4	34	5.1	16	1.9	6	1.8	1	--[4]
1993	148	1.7	101	1.5	20	3.1	22	2.7	4	--[4]	1	--[4]
1994	150	1.8	103	1.6	21	3.3	24	2.8	1	--[4]	1	--[4]
1995	121	1.5	77	1.2	15	2.6	19	2.3	9	2.6	1	--[4]
1996	113	1.4	67	1.1	29	5.3	13	1.7	3	--[4]	1	--[4]
1997	102	1.3	66	1.1	20	3.7	12	1.5	3	--[4]	1	--[4]
1998	99	1.2	69	1.1	12	2.2	15	1.7	3	--[4]	0	0.0
1999	86	1.1	59	1.0	14	2.4	10	1.1	3	--[4]	0	0.0
2000	89	1.1	55	0.9	17	2.9	11	1.2	5	1.1	1	--[4]
2001	99	1.2	55	0.9	15	2.6	20	2.1	5	1.0	4	--[4]
2002	98	1.2	54	0.9	20	3.4	17	1.8	3	--[4]	4	--[4]
2003	98	1.2	56	1.0	19	3.2	17	1.7	4	--[4]	2	--[4]
2004	85	1.1	43	0.8	19	3.1	18	1.8	3	--[4]	2	--[4]
2005	109	1.4	62	1.2	17	2.8	20	2.0	7	1.3	3	--[4]
2006	90	1.2	48	0.9	19	2.9	20	1.9	3	--[4]	0	0.0
2007	117	1.5	65	1.2	18	2.8	28	2.6	3	--[4]	3	--[4]

Note that infant deaths are based on a preliminary death file as of the release of this report.
1. Deaths of infants of unknown race are included in the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Other: American Indian and Other races. 3. Rates are expressed per 1,000 live births.
4. Calculations based on values of 1-4 are excluded.

Figure 8. Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 2007

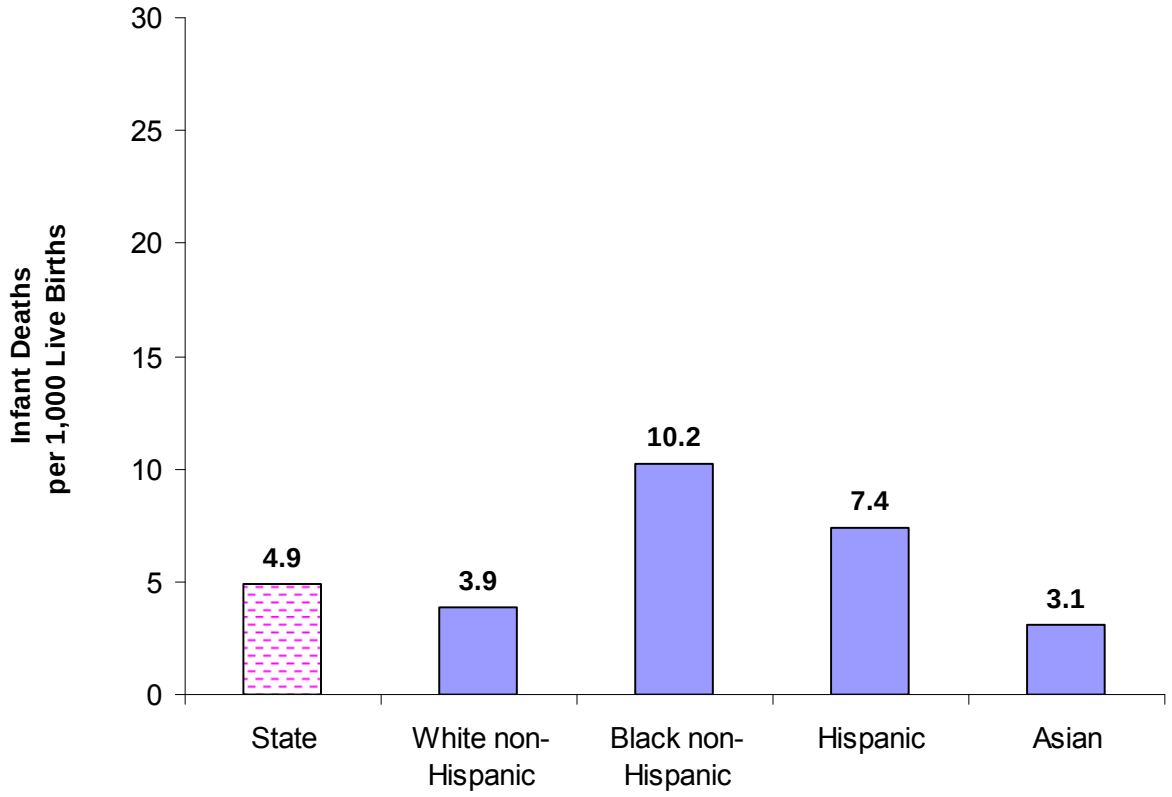


Table 12. Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2007

Municipality[1]	Rank (by pop. size)	Population	Crude Birth Rate[2]	Mother's Race and Ethnicity				Very Low Birthweight (<1500 g)	Low Birthweight (<2500 g)	Gestational Diabetes
				White non-Hispanic	Black non-Hispanic	Hispanic	Asian or Other[4]			
				%[3]	%[3]	%[3]	%[3]	%	%	%
STATE TOTAL		**6,449,755**	**12.1**	**67.5**	**8.3**	**13.9**	**10.1**	**1.4**	**7.9**	**4.2**
Attleboro	29	43,364	**13.4**	81.3	3.6	6.2	8.6	1.4	7.9	3.1
Barnstable	25	47,902	**10.0**	82.0	4.4	3.8	9.8	1.7	6.7	2.1
Boston	1	558,435	**14.1**	37.7	27.0	22.4	12.8	2.0	9.6	3.3
Brockton	6	100,366	**15.8**	33.1	43.9	10.1	12.9	1.8	10.0	5.4
Brookline	18	56,422	**11.8**	69.9	2.8	4.3	22.9	1.0	7.6	2.2
Cambridge	5	101,529	**12.0**	58.9	14.3	6.4	20.3	1.1	6.0	3.7
Chicopee	21	54,599	**11.1**	69.9	3.3	22.2	4.6	2.0	7.8	5.8
Fall River	9	92,117	**13.2**	79.8	5.1	9.3	5.7	1.6	8.0	10.3
Framingham	14	65,651	**15.5**	64.3	7.7	16.1	11.8	0.7	6.3	2.7
Haverhill	15	60,032	**15.5**	74.0	3.9	18.0	4.0	1.5	7.7	2.7
Lawrence	12	81,591	**17.4**	14.4	2.1	79.6	3.8	2.5	9.9	3.7
Leominster	30	42,120	**12.3**	67.9	6.2	18.2	7.4	1.9	8.5	5.2
Lowell	4	105,749	**17.3**	43.9	8.2	19.7	28.2	1.0	8.5	5.9
Lynn	8	92,186	**16.8**	31.5	12.3	44.2	11.9	2.1	8.7	4.0
Malden	17	56,730	**16.1**	44.3	17.7	10.6	27.3	2.7	9.2	5.7
Medford	22	53,801	**12.7**	69.2	9.9	7.0	13.7	1.6	8.9	3.5
Methuen	27	44,532	**13.7**	65.8	2.6	24.3	7.1	1.3	8.6	2.5
New Bedford	7	94,502	**14.6**	60.0	7.0	23.9	8.9	1.8	10.4	4.2
Newton	11	83,346	**9.8**	77.2	2.2	3.9	16.7	1.3	8.5	2.2
Peabody	24	50,954	**9.8**	83.1	2.2	8.9	5.8	1.0	9.5	2.0
Pittsfield	28	43,949	**12.8**	80.6	6.2	7.0	6.2	0.9	10.7	2.1
Plymouth	20	54,781	**13.1**	90.9	2.1	2.1	4.9	0.7	5.6	4.5
Quincy	10	90,458	**13.3**	56.4	5.4	3.5	34.5	1.3	7.6	5.6
Revere	26	45,551	**17.3**	47.4	4.7	33.2	14.5	1.5	8.9	6.6
Somerville	13	75,372	**12.8**	57.5	8.9	17.9	15.1	1.4	6.8	4.6
Springfield	3	156,358	**16.2**	24.8	20.6	50.3	4.3	2.0	10.4	3.9
Taunton	19	56,348	**13.3**	80.3	7.5	6.7	5.6	0.5	5.1	4.1
Waltham	16	59,564	**13.1**	52.2	7.2	21.2	19.4	0.9	7.9	4.9
Weymouth	23	53,708	**13.1**	83.3	3.5	3.0	9.9	0.9	5.7	5.8
Worcester	2	179,839	**14.2**	59.7	12.5	18.2	9.5	1.8	9.1	5.5

Table 12 (cont'd). Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2007

Municipality[1]	Birth					Deaths			
	Adequate Prenatal Care[6]	Public Payment[7] for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[9]		Neonatal Mortality Rate[9]	
	%	%	%	n	Rate[8]	2007	2005-2007	2007	2005-2007
STATE TOTAL	**82.8**	**35.5**	**33.4**	**4,944**	**22.0**	**4.9**	**4.9**	**3.4**	**3.5**
Attleboro	84.1	20.7	29.6	35	30.9	--[5]	3.3	--[5]	2.8
Barnstable	82.8	49.2	37.2	26	19.1	10.5	5.6	--[5]	--[5]
Boston	85.3	46.9	45.8	588	29.7	6.4	5.8	4.7	4.5
Brockton	72.1	62.3	54.1	171	47.0	7.6	7.3	3.8	4.9
Brookline	91.4	5.2	5.8	5	3.4	1.5	2.5	1.5	--[5]
Cambridge	86.7	17.4	15.3	25	6.4	--[5]	3.2	--[5]	2.7
Chicopee	78.9	53.6	50.0	76	43.7	--[5]	2.7	--[5]	--[5]
Fall River	84.3	66.3	58.1	167	59.0	13.1	8.5	11.5	6.1
Framingham	88.2	41.6	26.1	40	20.5	1.0	3.3	1.0	2.7
Haverhill	85.9	35.6	39.9	67	35.1	--[5]	4.9	--[5]	3.8
Lawrence	68.6	74.1	70.1	230	76.0	5.6	6.5	4.2	4.8
Leominster	80.4	39.7	38.7	46	36.7	--[5]	5.8	--[5]	5.1
Lowell	70.5	54.4	54.8	215	54.2	5.5	5.6	4.4	3.9
Lynn	76.4	66.4	54.7	175	56.7	7.7	5.1	5.8	4.4
Malden	83.3	42.7	28.5	37	25.9	--[5]	7.8	--[5]	7.1
Medford	85.1	27.9	23.0	21	11.8	--[5]	4.1	1.5	3.6
Methuen	79.4	33.1	35.7	39	29.4	1.6	--[5]	1.6	--[5]
New Bedford	66.7	60.0	60.5	197	66.7	8.7	8.7	5.8	5.7
Newton	88.9	6.2	7.7	2	--[5]	--[5]	3.3	--[5]	3.3
Peabody	86.5	33.9	29.6	22	15.4	--[5]	5.4	--[5]	4.0
Pittsfield	68.0	55.3	53.4	67	52.7	1.8	--[5]	1.8	--[5]
Plymouth	87.8	27.2	26.4	35	20.9	--[5]	4.3	0.0	--[5]
Quincy	87.8	33.2	25.7	38	18.3	--[5]	3.7	0.0	1.7
Revere	80.7	58.1	41.3	48	45.6	8.9	10.4	6.4	9.0
Somerville	84.3	40.7	30.9	24	11.1	8.3	5.5	7.3	4.8
Springfield	70.1	73.5	71.2	512	84.3	7.9	9.2	4.7	6.1
Taunton	73.3	46.4	46.4	55	33.7	--[5]	6.6	--[5]	4.4
Waltham	79.3	32.1	23.8	31	13.3	0.0	2.2	0.0	--[5]
Weymouth	90.7	25.9	22.0	25	17.2	--[5]	6.8	1.4	4.9
Worcester	72.7	51.6	50.5	251	35.7	8.2	9.0	5.5	7.0

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. The 30 largest municipalities are the cities/ towns in Massachusetts with the largest populations (See Technical Notes). 2. Crude birth rates represent the number of births per 1,000 residents; teen birth rates refer to the number of births per 1,000 females ages 15-19. Birth rates for cities/towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Mothers who designated themselves as Asian, American Indian, or Other. 5. Calculations based 1-4 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Births per 1,000 female residents ages 15-19. 8. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 9. Deaths per 1,000 live births. See Definitions of Rates section in the Glossary for definitions of infant and neonatal mortality rates.

Table 13. Birth Characteristics by Licensed Maternity Facility[1], Massachusetts: 2007

Facility	Location	Occurrence Births[2] (n)	Low Birthweight[3] (%)	Public Payment for Delivery[4] (%)	Adequate Prenatal Care[5] (%)	C-Section[6] (%)
State Total		**78,724**	**7.8**	**34.9**	**82.8**	**33.7**
Anna Jaques Hospital	Newburyport	698	4.0	25.5	87.6	29.5
Baystate Mary Lane Hospital	Ware	180	--[7]	56.7	76.3	28.9
Baystate Medical Center	Springfield	4,373	12.3	50.8	77.4	31.4
Berkshire Medical Center	Pittsfield	776	7.2	46.8	68.1	30.9
Beth Israel Deaconess Medical Center	Boston	4,806	12.7	18.9	90.6	42.0
Beverly Hospital	Beverly	2,000	5.0	34.5	95.7	32.4
Boston Medical Center	Boston	2,513	10.4	82.9	63.9	30.9
Brigham And Women's Hospital	Boston	8,302	11.4	20.6	95.4	34.1
Brockton Hospital	Brockton	1,449	5.9	66.4	79.3	39.9
Cambridge Birth Center	Cambridge	101	0.0	16.8	67.3	0.0
Cambridge Hospital	Cambridge	1,339	2.7	74.5	75.7	29.1
Cape Cod Hospital	Barnstable	1,050	3.8	45.4	84.7	29.5
Caritas Good Samaritan Medical Center	Brockton	899	6.6	56.4	58.0	39.7
Caritas Norwood Hospital	Norwood	547	4.2	27.5	73.4	39.7
Caritas St. Elizabeth's Medical Center Of Boston	Boston	1,229	13.8	26.7	82.1	40.4
Charlton Memorial Hospital	Fall River	1,657	6.5	52.8	86.7	33.7
Cooley Dickinson Hospital	Northampton	836	2.4	27.5	91.5	27.3
Emerson Hospital	Concord	1,131	4.2	7.0	78.0	37.5
Fairview Hospital	Great Barrington	158	--[7]	56.7	83.3	27.8
Falmouth Hospital	Falmouth	633	4.0	37.2	82.1	36.3
Franklin Medical Center	Greenfield	529	4.2	42.2	81.9	21.2
Harrington Memorial Hospital	Southbridge	412	5.6	52.2	86.7	35.2
Heywood Memorial Hospital	Gardner	589	4.8	44.5	81.6	18.8
Holyoke Hospital	Holyoke	616	6.3	74.0	59.7	19.2
Jordan Hospital	Plymouth	725	2.6	31.6	82.3	32.1
Lawrence General Hospital	Lawrence	1,887	5.9	59.3	71.9	33.5
Leominster Hospital	Leominster	1,112	4.4	47.0	85.5	24.7
Lowell General Hospital	Lowell	1,938	5.5	43.0	68.9	32.0
Martha's Vineyard Hospital	Oak Bluffs	180	--[7]	52.8	93.3	31.1
Massachusetts General Hospital	Boston	3,504	9.7	29.7	87.9	32.7
Melrose-Wakefield Hospital	Melrose	1,245	5.5	28.8	88.6	43.7
Mercy Medical Center	Springfield	1,237	3.7	55.3	77.8	27.7
Metrowest Medical Center-Framingham Union Campus	Framingham	1,923	5.3	38.5	90.6	41.8

Table 13 (cont'd). Birth Characteristics by Licensed Maternity Facility[1], Massachusetts: 2007

Facility	Location	Occurrence Births[2] (n)	Low Birthweight[3] (%)	Public Payment for Delivery[4] (%)	Adequate Prenatal Care[5] (%)	C-Section[6] (%)
Milford Regional Medical Center	Milford	1,075	3.6	27.2	92.2	38.9
Morton Hospital	Taunton	497	2.8	55.3	62.4	33.5
Mount Auburn Hospital	Cambridge	2,103	4.0	17.7	87.2	27.5
Nantucket Cottage Hospital	Nantucket	151	--[7]	45.3	82.1	29.1
Newton Wellesley Hospital	Newton	3,397	5.3	4.2	79.4	37.2
North Adams Regional Hospital	North Adams	289	7.3	53.7	90.7	22.5
North Shore Birth Center	Beverly	109	0.0	18.3	89.9	0.0
North Shore Medical Center - Salem Hospital	Salem	1,792	6.8	48.2	72.5	30.4
Saint Vincent Hospital	Worcester	1,856	3.8	16.8	86.9	28.7
Saints Memorial Medical Ctr.-St. John's Campus	Lowell	660	4.5	45.1	82.9	35.2
South Shore Hospital	Weymouth	3,805	5.5	15.9	92.3	44.3
Caritas Holy Family Hospital And Medical Center	Methuen	1,197	4.3	30.1	82.0	42.9
St. Luke's Hospital	New Bedford	1,568	9.0	53.0	66.0	31.7
Sturdy Memorial Hospital	Attleboro	1,017	3.9	17.1	80.1	35.9
Tobey Hospital	Wareham	415	2.9	37.8	90.8	17.1
Tufts-New England Medical Center Hospital	Boston	1,409	26.2	42.4	89.5	37.7
UMASS Memorial Medical Center - West Campus	Worcester	4,386	11.7	39.8	71.7	27.3
Winchester Hospital	Winchester	2,044	5.2	5.7	83.8	35.3
Other Hospitals		7	--[7]	50.0	85.7	28.6
Home, En route & Dr. Off.		373	6.5	25.5	64.0	1.2

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definition of occurrence births. 3. Less than 2,500 grams (5.5 lbs.) 4. Public payment for delivery includes Medicaid/MassHealth, Commonhealth, Medicare, Healthy Start, other government programs, and free care. 5. Based on the APNCU Index. 6. The percentages provided in this row are based on occurrence births and may differ from data presented elsewhere in this book which are based on resident births. 7. Calculations based on values of 1-4 for medical characteristics of facilities with less than 200 births are suppressed based on Guidelines for Release of Births Data, Center for Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health.

Table 14. Comparison of Massachusetts Perinatal Health Indicators with Healthy People 2010 Objectives[1], Massachusetts: 2004-2007

Healthy People 2010 Objectives (Focus Area 16: Maternal, Infant and Child Health[2])	HP2010 Target	Massachusetts 2004	2005	2006	2007	Has Massachusetts achieved HP2010 target? ✓ = YES ○ = NO, but within 25% of target ● = NO, > 25% from target
Fetal, Infant, and Maternal Deaths						
16-1a. Fetal Mortality Rate[3]	4.1	5.3	5.5	5.0	5.1	○
16-1b. Perinatal Mortality Rate[4]	4.5	5.8	5.4	5.7	5.2	○
16-1c. Infant Mortality Rate[5]	4.5	4.7	5.1	4.8	4.9	○
16-1d. Neonatal Mortality Rate[6]	2.9	3.7	3.7	3.6	3.4	○
16-1e. Postneonatal Mortality Rate[7]	1.2	1.1	1.4	1.2	1.5	○
16-4. Maternal Mortality Ratio[8]	3.3	6.3	10.3	8.9	8.9	●
Risk Factors						
16-10a. Low Birthweight[9] (%)	5.0	7.8	7.9	7.9	7.9	●
16-10b. Very Low Birthweight[10] (%)	0.9	1.5	1.4	1.3	1.4	●
16-11a. Preterm[11] (%)	7.6	9.2	9.0	9.0	9.0	○
Prenatal Care						
16-6a. Care beginning in first trimester (%)	90.0	83.5	83.2	82.1	82.0	○
16-6b. Early and adequate care[12] (%)	90.0	84.2	84.0	83.1	82.8	○
Obstetrical Care						
16-8. Very Low Birthweight[10] Infants born at Level III Hospitals[13] (%)	90.0	80.1	78.5	76.8	81.1	○
16-9a. Cesarean Sections: Low-Risk[14] Women Giving Birth for the First Time (%)	15.0	26.7	27.8	28.5	29.3	●
16-9b. Cesarean Sections: Low-Risk[14] Women with Prior Cesarean Section (%)	63.0	87.9	89.8	91.3	91.1	●
Breastfeeding						
16-19a. Breastfeeding[15] (%)	75.0	78.9	79.3	79.9	79.2	✓
Prenatal Substance Exposure						
16-17c. Abstinence from Smoking (%)	99.0	92.6	92.8	92.6	92.5	○

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. National health promotion and disease prevention agenda established by the U.S. Dept. of Health and Human Services. 2. Goal: to improve the health and well-being of women, infants, children, and families. 3. Number of fetal deaths per 1,000 fetal deaths plus live births. 4. Number of fetal and infant deaths in perinatal period (from 28 weeks gestation (inclusive) to 6 days (inclusive) after birth per 1,000 fetal deaths plus live births. 5. Number of infant deaths (under one year of age) per 1,000 live births. 6. Number of deaths to infants less than 28 days of age per 1,000 live births. 7. Number of deaths to infants 28-364 days of age per 1,000 live births. 8. See Definition of Rates section in Technical Notes. 9. Less than 2,500 grams, or 5.5 pounds. 10. Less than 1,500 grams, or 3.3 pounds. 11. Born before completion of 37th week of gestation. 12. Based on Adequacy of Prenatal Care Utilization Index (see Glossary). 13. Facilities for high-risk deliveries and neonates that can provide care to very small infants, including mechanical ventilation and neonatal surgery and special care for transferred patients and for which a full-time neonatologist serves as the director. 14. "Low-risk"= full term birth, singleton, vertex presentation. 15. HP2010 specifies objective as mother breastfeeding in "early postpartum period." Massachusetts data is based on mother's self-report of current breastfeeding or intention to breastfeed.

Appendix:

Additional Tables & Figures

Technical Notes

Glossary

Table 15. Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2007

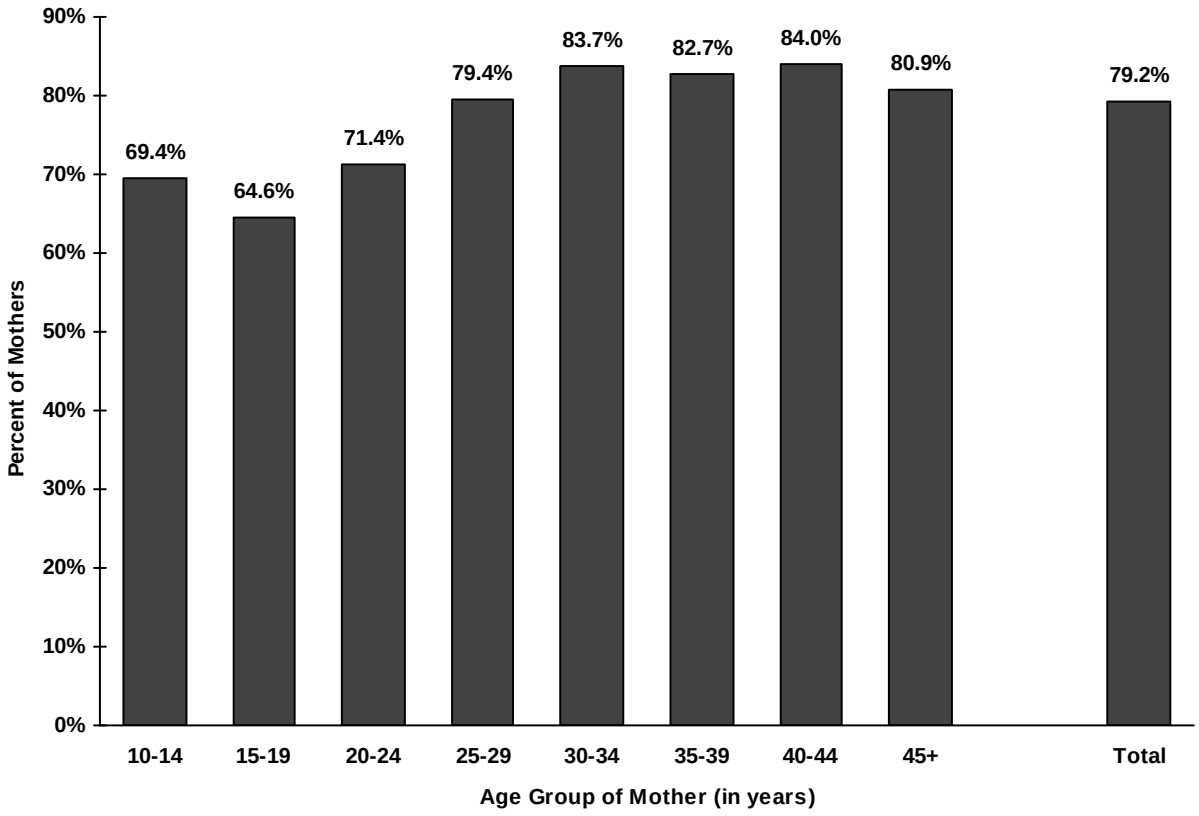
CHNA	Population	Crude Birth Rate[1]	Mother's Race and Ethnicity: White non-Hispanic % [3]	Black non-Hispanic % [3]	Hispanic % [3]	Asian and Other[2] % [3]	Very Low BWT (<1500 g) %	Low BWT (<2500) %	GDM %
STATE TOTAL	**6,449,755**	**12.1**	**67.5**	**8.3**	**13.9**	**10.1**	**1.4**	**7.9**	**4.2**
Community Health Network of Berkshire County	131,965	9.4	86.9	3.4	4.9	4.5	1.1	8.6	2.3
Upper Valley Health Web (Franklin County)	88,506	9.9	91.6	0.3	3.4	2.5	1.3	7.0	3.3
Partnership for Health in Hampshire County (Northampton)	151,801	8.2	82.3	2.3	6.9	8.1	1.0	6.1	3.3
The Community Health Connection (Springfield)	299,490	12.9	47.0	14.2	34.5	4.2	1.7	9.4	4.7
Community Health Network of Southern Worcester County	119,141	11.9	88.8	1.1	7.3	2.7	2.1	8.4	4.5
Community Partners for Health (Milford)	160,521	13.0	89.1	1.2	4.2	5.3	0.7	6.1	3.8
Community Health Network of Greater Metro West (Framingham)	379,658	12.4	78.1	3.1	7.1	11.6	0.9	6.8	3.3
Community Wellness Coalition (Worcester)	303,669	12.9	67.9	8.9	12.5	10.6	1.5	8.3	5.5
Fitchburg/Gardner Community Health Network	261,369	11.4	80.9	2.9	11.3	4.7	1.6	8.1	4.2
Greater Lowell Community Health Network	272,893	13.1	62.7	5.3	11.4	20.5	0.9	7.4	6.0
Greater Lawrence Community Health Network	195,176	14.0	43.6	1.9	47.7	6.8	1.8	9.3	3.4
Greater Haverhill Community Health Network	148,557	11.8	83.7	2.2	10.3	3.6	1.0	8.2	2.4
Community Health Network North (Beverly/Gloucester)	119,378	9.2	90.7	0.9	3.9	4.5	0.8	6.7	1.6
North Shore Community Health Network	287,352	12.1	59.9	6.7	24.9	8.4	1.7	8.4	3.4
Greater Woburn/Concord/Littleton Community Health Network	209,597	10.6	74.6	3.5	3.8	17.9	0.9	6.6	3.7
North Suburban Health Alliance (Medford/Malden/Melrose)	257,235	13.6	65.4	10.3	9.3	14.8	1.8	8.8	4.2
Greater Cambridge/Somerville Community Health Network	273,883	12.6	65.4	8.3	8.5	17.5	1.1	6.3	3.8
West Suburban Health Network (Newton/Waltham)	253,138	10.6	73.0	4.1	8.8	14.1	1.0	7.5	3.8
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	711,603	14.3	39.9	21.8	25.2	13.0	1.9	9.4	3.7
Blue Hills Community Health Alliance (Greater Quincy)	372,309	11.9	70.0	8.8	3.2	17.7	1.2	7.2	4.9
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	161,454	11.7	62.2	2.4	32.5	2.8	1.5	8.0	5.5
Greater Brockton Community Health Network	242,404	13.2	59.9	24.5	6.5	9.1	1.4	8.9	5.2
South Shore Community Partners in Prevention (Plymouth)	188,787	11.1	93.2	1.7	1.9	3.2	0.9	5.3	5.0
Greater Attleboro-Taunton Health & Education Response	252,919	11.9	86.6	3.7	3.6	5.8	0.9	6.7	4.2
Partners for a Healthier Community (Fall River)	141,977	11.4	84.2	4.0	7.1	4.6	1.5	7.9	10.0
Greater New Bedford Health & Human Services Coalition	199,955	11.3	72.4	5.1	15.2	7.1	1.3	9.2	4.2
Cape and Islands Community Health Network	252,204	9.4	85.8	3.8	4.7	5.6	0.9	6.4	2.3

Table 15 (cont'd) Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2007

CHNA	Births					Deaths			
	Adequate Prenatal Care[6]	Public Payment[7] for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[8]		Neonatal Mortality Rate[8]	
	%	%	%	n	Rate[4]	2007	2005-2007	2007	2005-2007
STATE TOTAL	**82.8**	**35.5**	**33.4**	**4,944**	**22.0**	**4.9**	**3.4**	**4.9**	**3.5**
Community Health Network of Berkshire County	75.1	50.2	45.8	121	27.0	--[5]	1.6	--[5]	1.3
Upper Valley Health Web (Franklin County)	83.2	40.5	38.6	74	26.1	--[5]	0.0	2.7	--[5]
Partnership for Health in Hampshire County (Northampton)	85.8	27.4	28.9	58	6.8	5.6	--[5]	3.9	2.5
The Community Health Connection (Springfield)	74.4	58.8	56.1	575	55.0	5.7	3.6	7.1	4.9
Community Health Network of Southern Worcester County	81.9	30.8	36.6	116	29.8	7.7	4.9	6.0	4.6
Community Partners for Health (Milford)	87.8	20.8	19.2	70	13.8	--[5]	0.0	2.9	1.9
Community Health Network of Greater Metro West (Framingham)	85.6	20.5	16.4	115	10.9	3.6	3.4	3.8	3.0
Community Wellness Coalition (Worcester)	75.7	37.9	38.6	290	27.0	5.6	3.8	7.1	5.4
Fitchburg/Gardner Community Health Network	82.4	32.8	33.3	235	26.8	7.0	5.0	5.7	4.1
Greater Lowell Community Health Network	76.4	35.4	36.4	266	29.7	4.2	3.1	4.7	3.2
Greater Lawrence Community Health Network	75.9	48.1	47.1	279	42.0	5.5	4.4	5.4	4.1
Greater Haverhill Community Health Network	87.4	27.5	30.5	106	23.2	5.1	2.8	5.0	3.7
Community Health Network North (Beverly/Gloucester)	94.5	27.0	21.4	29	7.4	--[5]	0.9	1.5	--[5]
North Shore Community Health Network	82.4	43.8	37.3	247	28.2	7.2	5.5	4.8	4.0
Greater Woburn/Concord/Littleton Community Health Network	86.6	9.9	12.4	32	5.7	2.2	--[5]	3.4	2.8
North Suburban Health Alliance (Medford/Malden/Melrose)	86.1	32.0	24.0	117	16.4	3.1	2.6	4.8	4.0
Greater Cambridge/Somerville Community Health Network	86.5	21.4	17.2	57	6.9	4.0	3.8	3.5	2.9
West Suburban Health Network (Newton/Waltham)	85.8	15.0	12.6	42	4.1	1.9	--[5]	2.1	1.8
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	85.2	46.4	43.7	732	31.0	60	4.4	5.8	4.4
Blue Hills Community Health Alliance (Greater Quincy)	88.3	23.3	20.5	116	11.2	4.7	2.3	4.7	2.9
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	77.1	55.2	50.3	264	46.2	6.9	4.8	5.8	4.4
Greater Brockton Community Health Network	79.6	42.6	39.6	230	26.1	5.6	3.1	5.1	3.3
South Shore Community Partners in Prevention (Plymouth)	89.1	22.1	23.9	74	12.5	2.9	--[5]	5.0	3.0
Greater Attleboro-Taunton Health & Education Response	80.6	27.5	29.7	148	19.1	2.3	2.0	3.4	2.5
Partners for a Healthier Community (Fall River)	85.9	58.9	51.0	183	42.2	12.3	10.5	8.2	5.7
Greater New Bedford Health & Human Services Coalition	73.0	47.9	50.2	253	38.9	6.6	4.0	7.3	4.6
Cape and Islands Community Health Network	85.2	40.1	31.3	115	17.6	4.2	2.1	3.9	1.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Births per 1,000 residents (male and female). 2005 rates are calculated using Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006 (see Technical Notes in Appendix). 2. Mothers who designated themselves as Asian, American Indian or Other. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Births per 1,000 female residents ages 15-19. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 5. Calculations based on 1-4 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Deaths per 1,000 live births. See Definitions of Rates section in Technical Notes for definitions of infant and neonatal mortality rates.

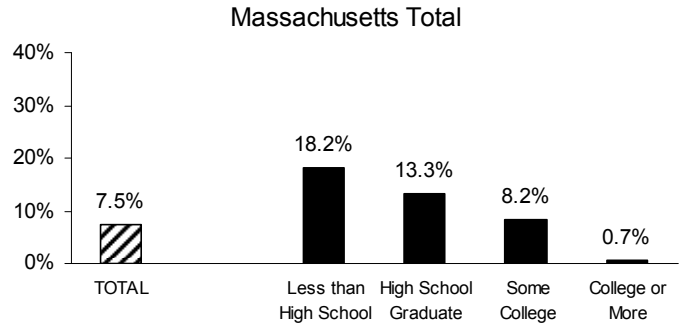
Figure 9. Percent of Mothers Breastfeeding or Intending to Breastfeed[1] by Age Group[2], Massachusetts: 2007

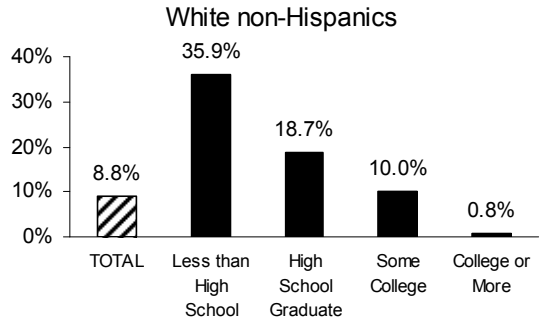


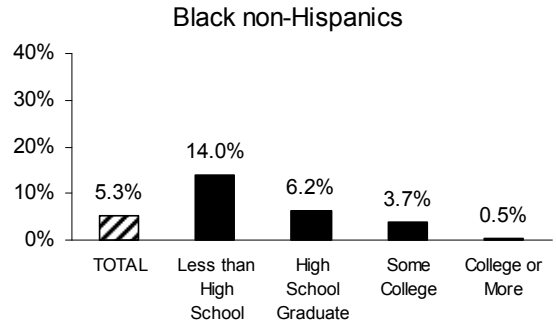
NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

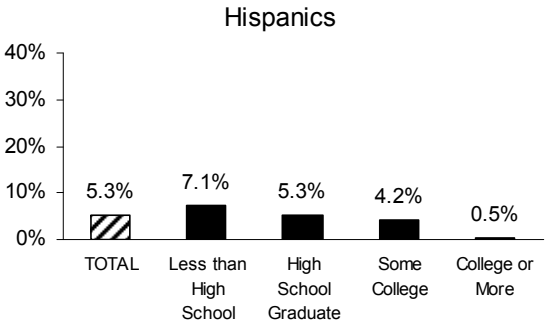
1. Information about breastfeeding is reported by the mother at the time of the birth.
2. For race-specific breastfeeding rates see Table 2.

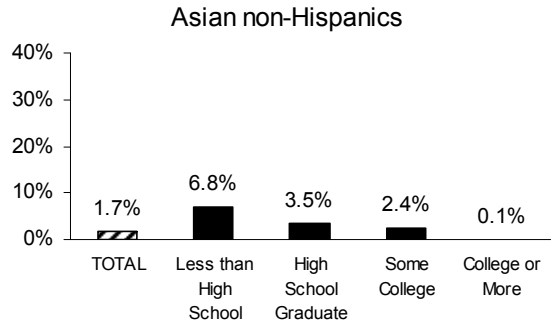
Figure 10. Percent of Mothers who Smoked During Pregnancy[1] by Mother's Race and Hispanic Ethnicity and Educational Attainment, Massachusetts: 2007







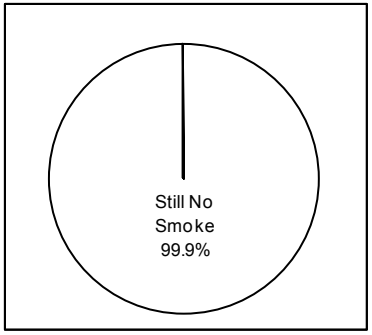
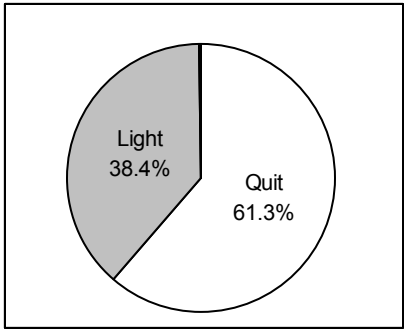
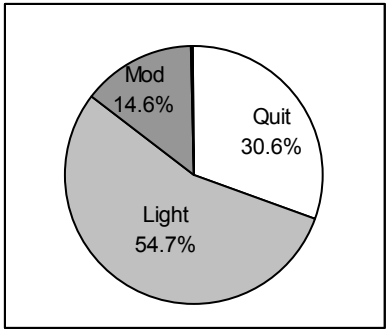
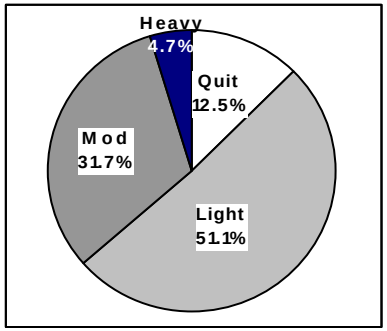




NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on information provided on parent worksheet. Because smoking is self-reported, data on smoking prevalence should be interpreted cautiously. Mothers with multiples are counted for each birth. Caution should be used with Asian data because of small numbers.

Figure 11. Distribution of Smoking Status[1] during Pregnancy by Smoking Status Prior to Pregnancy, Massachusetts: 2007

Smoking Status[1] Prior to Pregnancy:	Non-Smokers 85.7% (66,628)	Light Smokers 8.5% (6,620)	Moderate Smokers 5.3% (4,088)	Heavy Smokers 0.5% (423)
Smoking Status[1] During Pregnancy:				
	99.9% of Non-Smokers continued not smoking (0.1% started smoking)	**61% of Light Smokers quit Smoking (0.3% increased)**	**85% of Moderate Smokers decreased the number of cigarettes smoked daily or quit**	**95% of Heavy Smokers decreased the number of cigarettes smoked daily or quit**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Light Smokers=1-10 cigarettes daily; Moderate Smokers=11-20 cigarettes daily; Heavy Smokers=21 cigarettes or more daily.

Table 16. Parity[1] by Age of Mother, Massachusetts: 2007

Age of Mother (years)		Total Births	1st	2nd	3rd	4th	5th+
State Total	**N[2]**	**77,934**	**35,081**	**26,772**	**10,782**	**3,457**	**1,700**
	%[3]	100.0	45.1	34.4	13.9	4.4	2.2
10-14	**N[2]**	49	49	0	0	0	0
	%[3]	100.0	100.0	0.0	0.0	0.0	0.0
15-19	**N[2]**	4,944	4,277	588	66	6	1
	%[3]	100.0	86.6	11.9	1.3	0.1	--
20-24	**N[2]**	12,598	7,364	3,812	1,108	255	47
	%[3]	100.0	58.5	30.3	8.8	2.0	0.4
25-29	**N[2]**	19,283	9,251	6,372	2,508	782	337
	%[3]	100.0	48.1	33.1	13.0	4.1	1.8
30-34	**N[2]**	23,334	9,223	9,062	3,418	1,072	516
	%[3]	100.0	39.6	38.9	14.7	4.6	2.2
35-39	**N[2]**	14,336	3,970	5,758	2,985	1,027	558
	%[3]	100.0	27.8	40.3	20.9	7.2	3.9
40-44	**N[2]**	3,151	869	1,113	662	283	214
	%[3]	100.0	27.7	35.4	21.1	9.0	6.8
45+	**N[2]**	237	77	67	34	32	27
	%[3]	100.0	32.5	28.3	14.3	13.5	11.4

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest unless otherwise stated.

1. The number of live births including this birth.
2. State totals include births of unknown parity and unknown mother's age.
3. Percents may not sum to 100.0 due to rounding.

Table 17. Selected Birth Characteristics by Maternal Education, Massachusetts: 2007

	Less than High School		High School Graduate		Some College		College Graduate		More than College	
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]
State Total	**8,664**	**11.1**	**19,754**	**25.4**	**16,968**	**21.8**	**20,009**	**25.7**	**12,345**	**15.9**
Race										
White non-Hispanic	3,059	5.8	11,467	21.8	11,852	22.6	16,171	30.8	9,995	19.0
Black non-Hispanic	852	13.2	2,371	36.7	1,994	30.9	945	14.6	294	4.6
Hispanic	3,894	35.9	4,047	37.3	1,862	17.2	751	6.9	303	2.8
Asian	498	8.7	1,071	18.6	805	14.0	1,821	31.7	1,557	27.1
Age										
20-29	4,399	13.8	11,400	35.8	8,500	26.7	5,581	17.5	1,939	6.1
30-39	1,551	4.1	5,741	15.3	7,472	19.9	13,310	35.4	9,491	25.3
40+	169	5.0	550	16.3	633	18.8	1,101	32.7	914	27.1
Non-U.S.-born[2]	3,550	41.0	6,292	31.9	3,773	22.2	4,520	22.6	3,036	24.6
Unmarried	6,519	75.2	11,165	56.5	6,132	36.2	1,701	8.5	437	3.5
Publicly-financed prenatal care	7,298	85.3	12,139	62.4	5,691	35.1	1,668	8.4	328	2.7
Very low birthweight[3]	139	1.6	304	1.5	242	1.4	231	1.2	117	0.9
Low birthweight[4]	805	9.3	1,719	8.7	1,331	7.9	1,427	7.1	824	6.7
Adequate prenatal care[5]	5,795	68.9	15,214	78.2	14,041	84.2	17,549	88.2	10,916	88.8
cesarean delivery	2,261	26.1	6,174	31.3	5,984	35.3	7,345	36.7	4,435	36.0
Breastfeeding[6]	5,737	66.5	13,898	71.0	12,504	76.5	17,441	87.6	11,250	91.5
Multiple births	185	2.1	612	3.1	759	4.5	1,127	5.6	736	6.0
Smoking during pregnancy	1,574	18.2	2,621	13.3	1,391	8.2	186	0.9	46	0.4

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

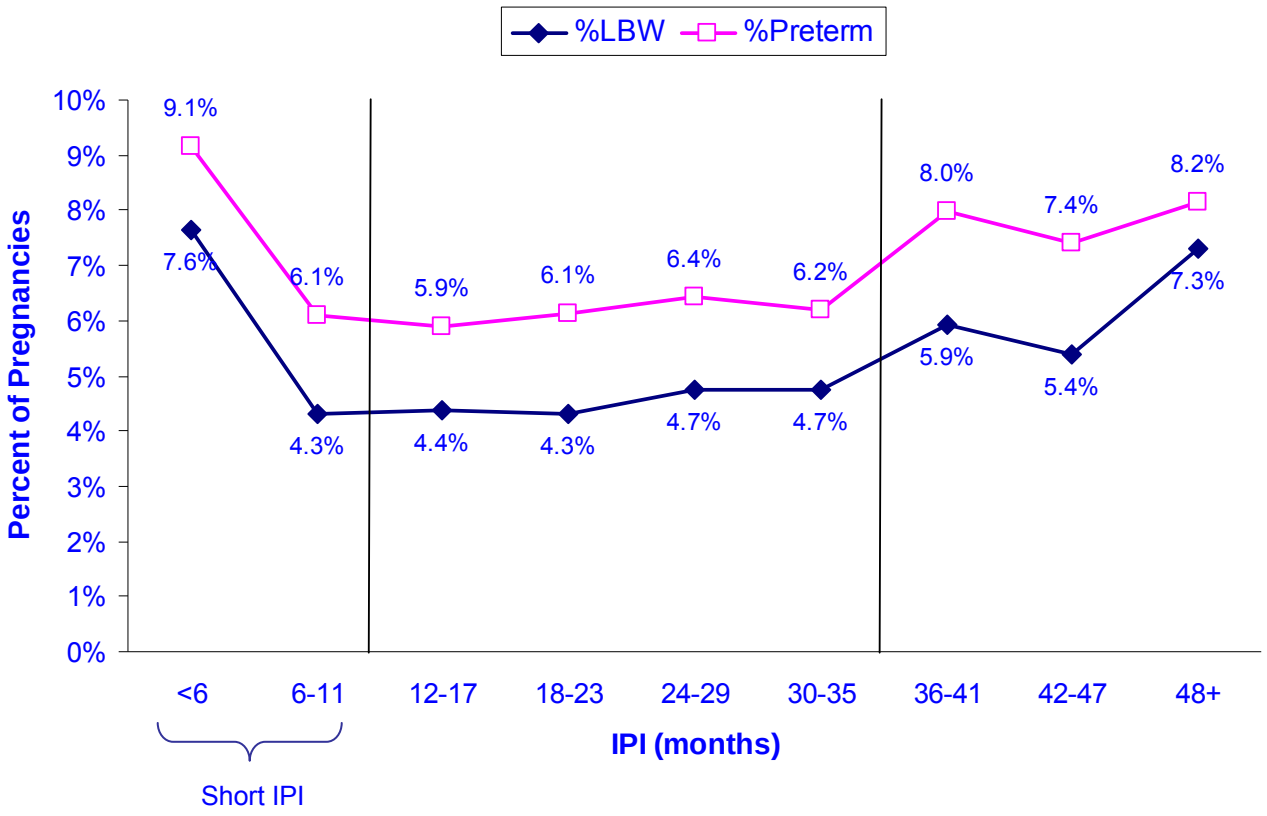
1. For state total, race and age categories, percentages are based on row totals. For all other categories, percentages are based on state column totals. 2. Includes women born outside of the 50 U.S. States, Washington D.C., and Puerto Rico/U.S. territories (the U.S. Virgin Islands, and Guam). 3. Very low birthweight: less than 1,500 grams or 3.3 pounds. 4. Low birthweight: less than 2,500 grams or 5.5 pounds. 5. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 6. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

Table 18. Inter-pregnancy Interval[1] (IPI) and Birth Outcomes -- Pregnancies to Multiparous[2] Mothers, Massachusetts: 2007

	IPI (months)	Pregnancies	Birth Weight (BW)				Gestational Age (GA)			
			Low (<2,500 g)		Very Low (<1,500 g)		Preterm[3] (<37 wk)		Very Early[4] (<28 wk)	
			n	%LBW	n	%VLBW	n	%Preterm	n	%VEGA
	State Total	40,718	2,256	**5.5%**	343	**0.8%**	2,853	**7.0%**	165	**0.4%**
	<6	1,860	142	**7.6%**	27	**1.5%**	170	**9.1%**	17	**0.9%**
	6-11	4,699	203	**4.3%**	29	**0.6%**	286	**6.1%**	10	**0.2%**
	12-17	5,782	252	**4.4%**	44	**0.8%**	341	**5.9%**	18	**0.3%**
	18-23	5,016	216	**4.3%**	25	**0.5%**	307	**6.1%**	10	**0.2%**
	24-29	4,197	199	**4.7%**	27	**0.6%**	270	**6.4%**	17	**0.4%**
	30-35	3,273	155	**4.7%**	17	**0.5%**	203	**6.2%**	6	**0.2%**
	36-41	2,644	157	**5.9%**	23	**0.9%**	211	**8.0%**	16	**0.6%**
	42-47	1,948	105	**5.4%**	14	**0.7%**	144	**7.4%**	7	**0.4%**
	48+	11,299	827	**7.3%**	137	**1.2%**	921	**8.2%**	64	**0.6%**
Short	**0-11**	6,559	345	**5.3%**	56	**0.7%**	456	**24.5%**	27	**1.5%**
	12-35	18,268	822	**4.5%**	113	**0.6%**	1,121	**60.3%**	51	**2.7%**
	36+	15,891	1,089	**6.9%**	174	**1.2%**	1,276	**68.6%**	87	**4.7%**

1. Interpregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times. 3. Also known as premature delivery. 4. Very early gestational age (VEGA) refers to birth delivery before 28 weeks of gestational age and is also known as ***extremely preterm*** delivery.

Figure 12. Inter-pregnancy Interval (IPI)[1] vs. LBW[2] and Preterm[3] Pregnancies to Multiparous Mothers[4], Massachusetts: 2007



NOTE: Short IPIs (less than 12 months) and IPIs over 35 months were associated with higher proportions on low birthweight and premature deliveries.

Percentages are calculated based on pregnancies to mothers who gave birth to their 2nd or later child in 2006 and with known values for the characteristic(s) of interest, unless otherwise stated.

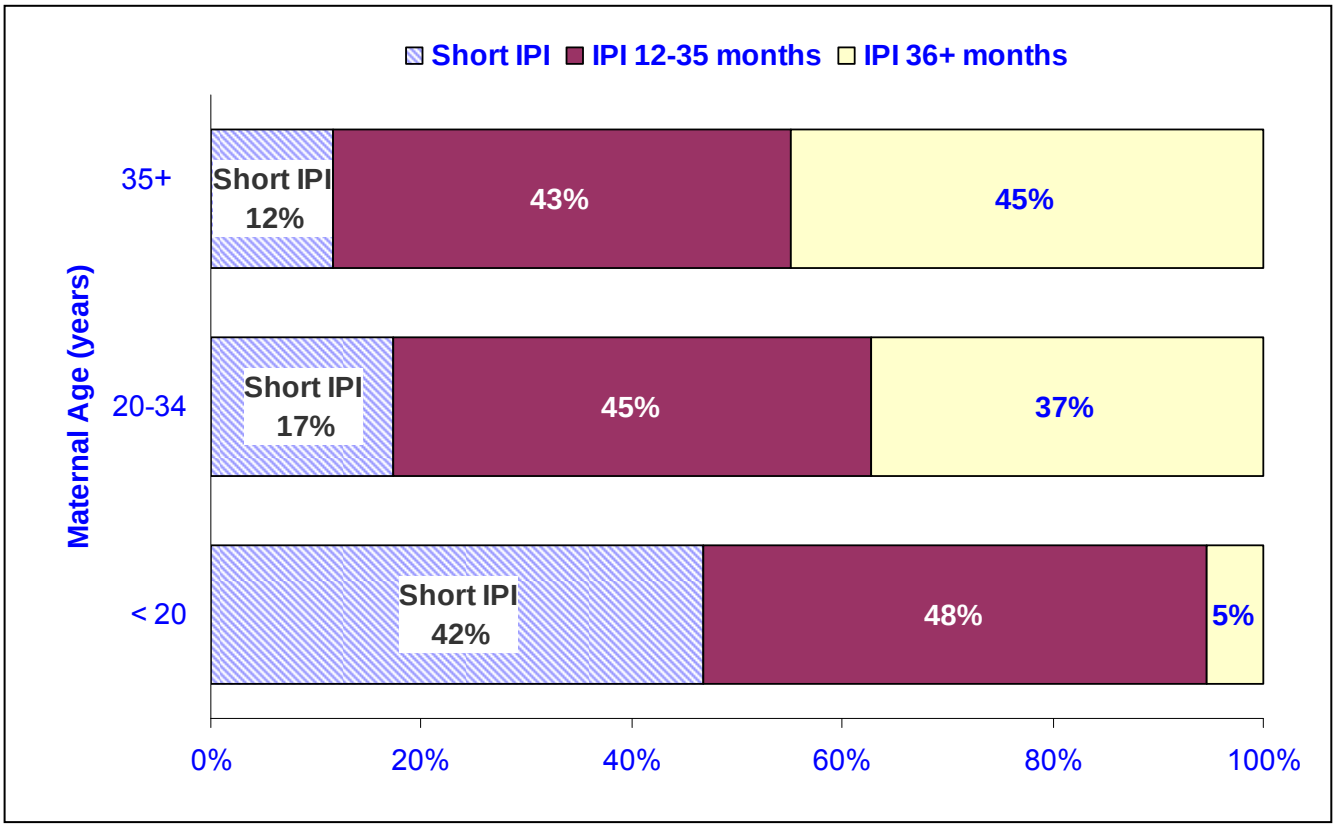
1.Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Low birthweight: less than 2,500 grams or 5.5 pounds. 3. Preterm delivery is defined as gestational age less than 37 weeks. It is also known as premature delivery. 4. Multiparous is defined as having given birth two or more times.

Table 19. Inter-pregnancy Interval[1] (IPI) by Maternal Characteristics Pregnancies to Multiparous Mothers[2], Massachusetts: 2007

	Total Pregnancies Parity >1		IPI					
			Short < 12 months		12-35 months		36+ months	
	n	%	n	%	n	%	n	%
State Total[3]	**40,718**	**100%**	**6,559**	**16.1%**	**18,268**	**44.9%**	**15,891**	**39.0%**
Age								
< 20	606	1.5%	284	46.9%	289	47.7%	33	5.4%
20-34	28,020	68.8%	4,868	17.4%	12,731	45.4%	10,421	37.2%
35+	12,092	29.7%	1,407	11.6%	5,248	43.4%	5,437	45.0%
Race Ethnicity								
White non-Hispanic	26,995	66.3%	4,495	16.7%	13,401	49.6%	9,099	33.7%
Black non-Hispanic	3,611	8.9%	547	15.1%	1,199	33.2%	1,865	51.6%
Hispanic	6,263	15.4%	967	15.4%	2,117	33.8%	3,179	50.8%
Asian non-Hispanic	2,778	6.8%	391	14.1%	1,178	42.4%	1,209	43.5%
Education								
High School or less	15,256	37.5%	2,448	16.0%	5,377	35.2%	7,431	48.7%
BA or Assoc	19,298	47.4%	3,152	16.3%	9,228	47.8%	6,918	35.8%
More than college	6,088	15.0%	951	15.6%	3,633	59.7%	1,504	24.7%
Delivery Payment Source								
Public	14,743	36.2%	2,458	16.7%	5,102	34.6%	7,183	48.7%
Private	24,941	61.3%	3,936	15.8%	12,649	50.7%	8,356	33.5%
Region of Residence								
Western MA	4,987	12.2%	860	17.2%	2,135	42.8%	1,992	39.9%
Central MA	5,425	13.3%	898	16.6%	2,526	46.6%	2,001	36.9%
Northeast MA	8,521	20.9%	1,351	15.9%	3,818	44.8%	3,352	39.3%
Metrowest MA	8,992	22.1%	1,379	15.3%	4,638	51.6%	2,975	33.1%
Southeast MA	7,837	19.2%	1,331	17.0%	3,300	42.1%	3,206	40.9%
Boston Region	4,956	12.2%	740	14.9%	1,851	37.3%	2,365	47.7%
Town of Residence[4]				**Top 10**		**Top 10**		**Top 10**
				Fitchburg (25.2%)		Natick (60%)		Chelsea (57.7%)
				Holyoke (23.3%)		Arlington (60%)		Everett (56.7%)
				Billerica (22.3%)		Franklin (58.1%)		Revere (54.1%)
				Leominster (22.2%)		Needham (57.5%)		Randolph (53.9%)
				Plymouth (21.9%)		Newton (56.5%)		Brockton (52.5%)
				Westfield (21.4%)		Brookline (55.8%)		Malden (50%)
				Quincy (20.4%)		Beverly (52.5%)		Lawrence (49.6%)
				Methuen (19.2%)		Weymouth (52.1%)		Lynn (47.6%)
				Beverly (18.6%)		Cambridge (50.9%)		Boston (47.2%)
				Taunton (18.3%)		Braintree (50.6%)		Fall River (47%)

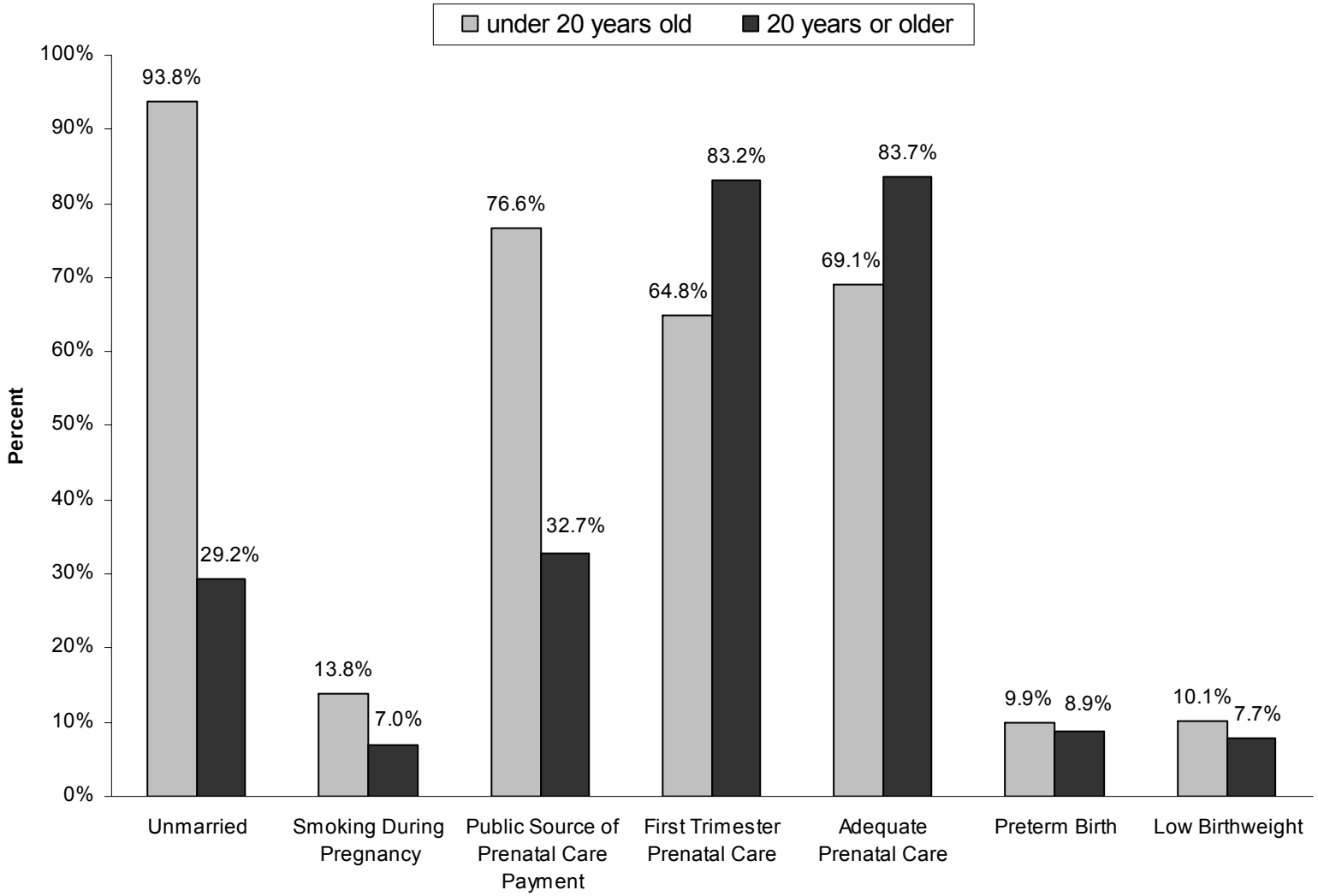
1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times. 3. State total includes pregnancies with known IPI.
4. Among towns with at least 200 mothers giving birth to their 2nd or later child.

Figure 13. Inter-pregnancy Interval (IPI)[1] Distribution by Maternal Age -- Pregnancies to Multiparous Mothers[2], Massachusetts: 2007



1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times.

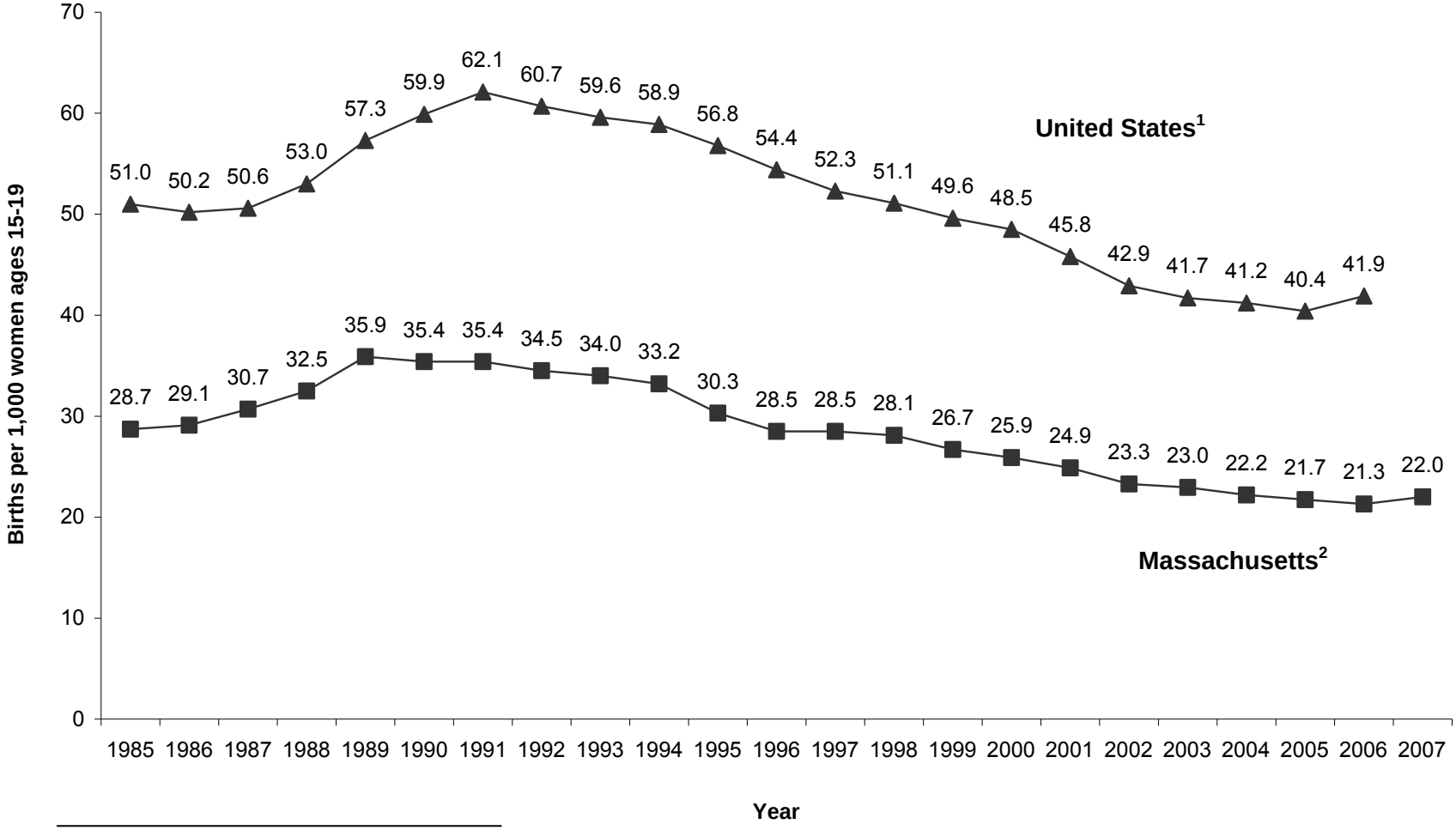
Figure 14. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2007



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Three age groups are used for "teen births": 10-14, 15-19, and <20. The "10-14" group refers to young teens, and the "15-19" group is the age group referred to as teens by the Centers for Disease Control and Prevention. For this publication, "<20" is used when comparing young women with "adult" women.

Definitions: Adequate Prenatal Care = based on Adequacy of Prenatal Care Utilization (APNCU) Index. See Appendix (Glossary and Technical Notes) for more details on the APNCU Index. Preterm Birth = gestational age less than 37 weeks, based on clinical estimate of gestational age. Low Birthweight = less than 2,500 grams (5.5 lbs.).

Figure 15. Trend in Birth Rates Among Women Ages 15-19, Massachusetts and the United States: 1985-2007



Teen birth rate is the number of births to women ages 15-19 per 1,000 women ages 15-19

Data sources: 1) U.S. annual natality data (NCHS) and 1990 U.S. Census data (population data used in denominators); 2) Massachusetts: annual birth data files, decennial Census counts (1990) and intercensal population estimates based on MISER (Massachusetts Institute for Social and Economic Research) population estimates for 1991 through 1998. 1999 rates are calculated using the 1999 DPH Massachusetts population estimates and Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2000-2005, released October 2006 (see Technical Notes in Appendix). 2007 birth rates are based on the 2007 population estimates from the National Center for Health Statistics. PLEASE NOTE: DIFFERENCES BETWEEN THESE RATES AND PREVIOUSLY PUBLISHED DATA REFLECT UPDATES IN POPULATION ESTIMATES.

Table 20. Resident Teen Birth Characteristics, 30 Largest Municipalities[1], Massachusetts: 2007

Municipality	Total Population Rank	Female Population, age 15-19	Number of Teen Births	Teen Birth Rate[2]	Mother's Race and Hispanic Ethnicity (% of teen births)			
					White non-Hispanic	Black non-Hispanic	Hispanic	Asian or other[3]
State Total		**224,406**	**4,944**	**22.0**	**46.0**	**12.7**	**34.5**	**6.8**
Attleboro	29	1,134	35	30.9	77.1	5.7	8.6	8.6
Barnstable	25	1,360	26	19.1	76.9	15.4	3.8	3.8
Boston	1	19,770	588	29.7	11.6	44.7	34.9	8.8
Brockton	6	3,638	171	47.0	27.5	42.7	17.5	12.3
Brookline	18	1,451	5	3.4	40.0	0.0	20.0	40.0
Cambridge	5	3,923	25	6.4	40.0	32.0	24.0	4.0
Chicopee	21	1,738	76	43.7	57.9	2.6	38.2	1.3
Fall River	9	2,829	167	59.0	71.9	5.4	15.6	7.2
Framingham	14	1,955	40	20.5	40.0	12.5	47.5	0.0
Haverhill	15	1,908	67	35.1	58.2	1.5	35.8	4.5
Lawrence	12	3,027	230	76.0	10.4	0.4	84.8	4.3
Leominster	30	1,254	46	36.7	56.5	0.0	39.1	4.3
Lowell	4	3,966	215	54.2	27.9	3.7	32.1	36.3
Lynn	8	3,084	175	56.7	17.7	10.9	58.9	12.6
Malden	17	1,430	37	25.9	37.8	32.4	27.0	2.7
Medford	22	1,776	21	11.8	38.1	19.0	14.3	28.6
Methuen	27	1,327	39	29.4	48.7	0.0	48.7	2.6
New Bedford	7	2,955	197	66.7	45.2	7.1	40.6	7.1
Newton	11	3,500	2	--[5]	--[5]	--[5]	--[5]	--[5]
Peabody	24	1,432	22	15.4	63.6	0.0	31.8	4.5
Pittsfield	28	1,270	67	52.7	77.6	9.0	7.5	6.0
Plymouth	20	1,672	35	20.9	85.7	5.7	5.7	2.9
Quincy	10	2,078	38	18.3	71.1	2.6	10.5	15.8
Revere	26	1,053	48	45.6	41.7	4.2	43.8	10.4
Somerville	13	2,170	24	11.1	25.0	20.8	50.0	4.2
Springfield	3	6,074	512	84.3	12.5	19.3	64.8	3.3
Taunton	19	1,631	55	33.7	70.9	10.9	12.7	5.5
Waltham	16	2,340	31	13.3	35.5	16.1	48.4	0.0
Weymouth	23	1,452	25	17.2	76.0	8.0	12.0	4.0
Worcester	2	7,036	251	35.7	64.9	6.0	26.7	2.4

Table 20 (cont'd). Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2007

Municipality	Public Payment for Prenatal Care[4] (%)	Unmarried (%)	Low Birthweight[6] (%)	Preterm[7] (%)	Adequacy of Prenatal Care[8]			
					Adequate Intensive	Adequate Basic	Intermediate	Inadequate
State Total	**76.6**	**93.7**	**10.1**	**9.9**	**31.6**	**37.7**	**10.8**	**19.9**
Attleboro	31.0	97.1	14.3	11.4	42.4	30.3	3.0	24.2
Barnstable	76.0	100.0	3.8	7.7	26.9	46.2	7.7	19.2
Boston	76.1	97.4	11.1	11.7	27.9	53.7	7.9	10.5
Brockton	83.4	93.6	11.7	11.7	24.9	34.9	15.4	24.9
Brookline	40.0	80.0	0.0	0.0	0.0	60.0	20.0	20.0
Cambridge	50.0	88.0	4.0	4.0	32.0	36.0	0.0	32.0
Chicopee	76.3	92.1	6.6	5.3	33.3	36.0	13.3	17.3
Fall River	90.7	93.4	12.0	9.6	65.9	19.5	0.0	14.6
Framingham	82.5	85.0	2.5	2.5	45.0	32.5	5.0	17.5
Haverhill	76.9	97.0	10.4	10.6	28.4	49.3	7.5	14.9
Lawrence	85.0	93.9	15.2	15.2	20.0	34.8	21.3	23.9
Leominster	56.5	89.1	6.5	6.5	35.6	35.6	8.9	20.0
Lowell	83.8	94.9	7.4	9.3	22.8	36.3	9.8	31.2
Lynn	87.2	89.7	11.4	9.7	37.9	36.2	6.9	19.0
Malden	77.8	86.5	2.7	2.7	22.2	38.9	0.0	38.9
Medford	66.7	90.5	0.0	0.0	25.0	30.0	15.0	30.0
Methuen	71.8	97.4	2.6	0.0	38.5	30.8	15.4	15.4
New Bedford	70.6	92.9	11.7	7.6	22.3	33.5	21.3	22.8
Newton	0.0	100.0	0.0	50.0	0.0	0.0	50.0	50.0
Peabody	86.4	81.8	9.1	0.0	31.8	40.9	9.1	18.2
Pittsfield	79.1	92.5	11.9	6.0	14.9	41.8	28.4	14.9
Plymouth	82.9	94.3	8.6	2.9	22.9	45.7	8.6	22.9
Quincy	73.7	94.7	7.9	10.5	30.6	61.1	0.0	8.3
Revere	68.8	89.6	10.4	8.3	46.8	27.7	4.3	21.3
Somerville	82.6	91.7	4.2	8.3	25.0	54.2	8.3	12.5
Springfield	88.6	94.1	12.7	11.9	27.3	36.3	10.8	25.5
Taunton	90.7	90.9	5.5	11.1	22.2	44.4	16.7	16.7
Waltham	86.7	90.3	12.9	3.2	38.7	25.8	6.5	29.0
Weymouth	60.0	76.0	8.0	20.0	44.0	52.0	4.0	0.0
Worcester	74.9	96.0	12.7	10.4	27.1	37.1	17.1	18.7

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006 (see Technical Notes in Appendix). 2. Birth rates represent the number of births per 1,000 females ages 15-19. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 3. Mothers who designated themselves as Asian, American Indian, or Other. 4. See Glossary under "Prenatal Care Payment Source." 5. Calculations based on values of 1-4 are excluded. 6. Less than 2,500 grams or 5.5 pounds. 7. Less than 37 weeks gestational age. 8. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary and Technical Notes in the Appendix for definitions of index and adequacy categories.

Table 21. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race[1], Massachusetts: 1980-2007

INFANT MORTALITY (less than one year of age)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1980	748	10.3	655	9.8	87	18.6	5	4.6
1981	710	9.6	616	9.1	85	18.2	8	6.1
1982	764	10.1	656	9.4	102	21.3	5	3.3
1983	682	9.0	579	8.3	89	19.0	12	7.4
1984	699	8.9	601	8.4	82	16.4	13	7.5
1985	745	9.1	608	8.1	126	23.8	11	6.1
1986	695	8.4	560	7.5	123	22.0	11	4.6
1987	608	7.2	486	6.4	110	17.5	12	4.5
1988	693	7.9	546	7.0	133	19.5	13	3.8
1989	697	7.6	549	6.8	131	17.7	17	4.8
1990	649	7.0	519	6.4	106	13.7	24	6.5
1991	577	6.5	461	6.0	102	13.8	14	3.9
1992	569	6.5	438	5.7	114	15.8	17	4.7
1993	523	6.2	423	5.7	87	12.5	13	3.5
1994	499	6.0	407	5.6	81	12.0	11	2.9
1995	419	5.1	333	4.7	65	10.3	21	5.5
1996	403	5.0	329	4.7	65	10.8	8	2.0
1997	425	5.3	349	5.0	66	10.6	10	2.4
1998	414	5.1	345	4.9	59	9.3	10	2.3
1999	418	5.2	334	4.8	75	11.4	9	1.9
2000	377	4.6	280	4.0	76	11.7	19	3.6
2001	407	5.0	314	4.5	77	11.7	16	3.0
2002	397	4.9	306	4.5	74	11.1	17	2.9
2003	383	4.8	290	4.3	78	11.8	15	2.6
2004	376	4.8	285	4.3	75	11.1	15	2.5
2005	391	5.1	308	4.8	63	9.3	20	3.5
2006	369	4.8	283	4.4	75	10.5	10	1.7
2007	380	4.9	286	4.4	73	10.0	18	2.8

Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race[1], Massachusetts: 1980-2007

NEONATAL MORTALITY (birth to 27 days old)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1980	550	7.6	483	7.2	62	13.3	5	4.6
1981	510	6.9	442	6.5	59	12.4	5	3.8
1982	573	7.6	494	7.1	75	15.7	3	--[5]
1983	482	6.3	411	5.9	63	13.4	7	4.3
1984	472	6.0	411	5.8	49	9.8	8	4.6
1985	538	6.6	447	6.0	85	16.0	5	2.8
1986	478	5.8	383	5.2	89	15.9	5	2.1
1987	432	5.1	343	4.6	80	12.7	9	3.4
1988	477	5.4	383	4.9	87	12.8	6	1.8
1989	479	5.2	376	4.7	95	12.8	8	2.3
1990	446	4.8	347	4.3	80	10.3	9	5.1
1991	401	4.5	319	4.1	72	9.8	10	2.8
1992	415	4.8	325	4.3	79	10.9	11	3.1
1993	375	4.4	300	4.1	66	9.5	9	2.4
1994	349	4.2	280	3.8	60	8.9	9	2.4
1995	298	3.6	237	3.3	50	7.9	11	2.9
1996	290	3.6	249	3.5	35	5.8	5	1.2
1997	323	4.0	271	3.9	45	7.2	7	1.7
1998	315	3.9	261	3.7	47	7.4	7	1.6
1999	332	4.1	265	3.8	61	9.3	6	1.3
2000	288	3.5	214	3.1	58	8.9	14	2.7
2001	308	3.8	239	3.5	59	9.0	10	1.9
2002	299	3.7	235	3.4	51	7.6	13	2.2
2003	285	3.6	217	3.2	58	8.8	10	1.8
2004	291	3.7	224	3.4	54	8.0	13	2.2
2005	282	3.7	226	3.5	45	6.6	11	1.9
2006	279	3.6	215	3.3	56	7.8	7	1.2
2007	263	3.4	194	3.0	52	7.2	15	2.4

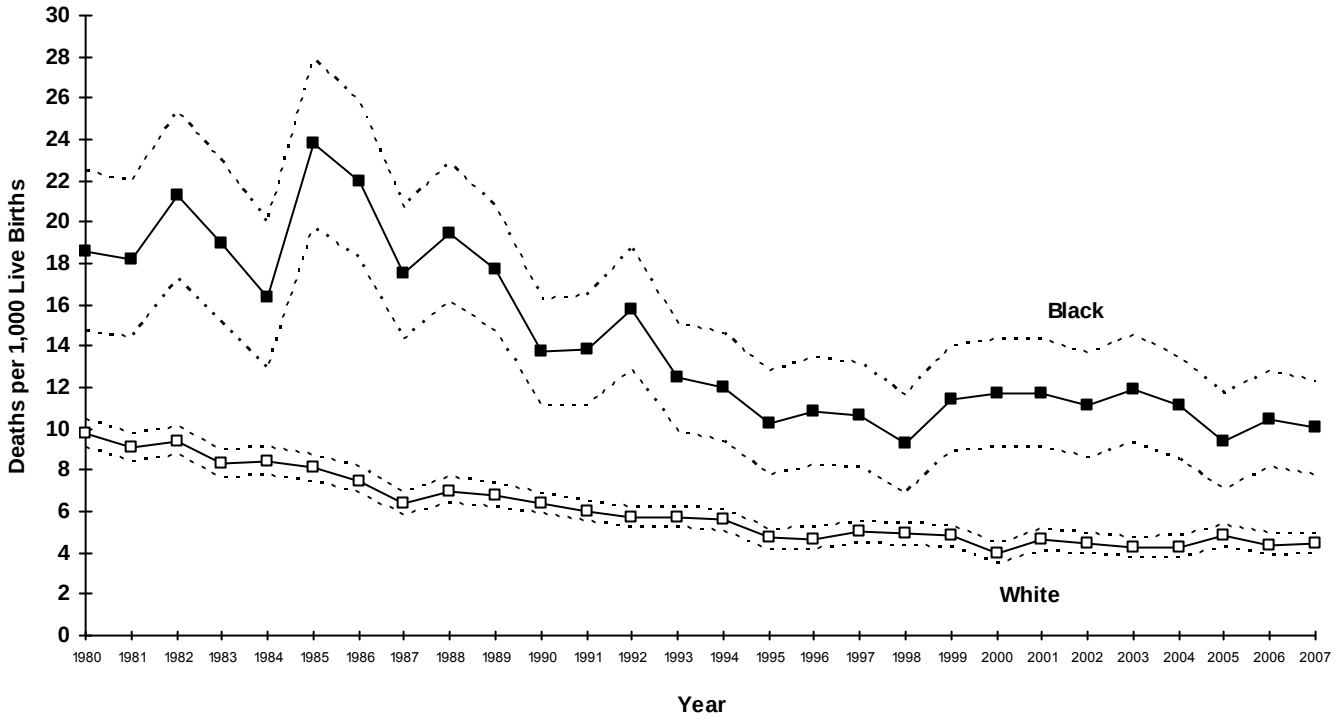
Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race[1], Massachusetts: 1980-2007

POST NEONATAL MORTALITY (28-364 days old)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1980	198	2.7	172	2.6	25	5.3	0	0.0
1981	200	2.7	174	2.6	26	5.8	3	--[5]
1982	191	2.5	162	2.3	27	5.6	2	--[5]
1983	200	2.7	168	2.4	26	5.6	5	3.1
1984	227	2.9	190	2.6	33	6.6	5	2.9
1985	207	2.5	161	2.1	41	7.8	6	3.3
1986	217	2.6	177	2.3	34	6.1	6	2.5
1987	176	2.1	143	1.8	30	4.8	3	--[5]
1988	216	2.5	163	2.1	46	6.7	7	2.0
1989	218	2.4	173	2.1	36	4.9	9	2.5
1990	203	2.2	172	2.1	26	3.4	5	1.4
1991	176	2.0	142	1.8	30	4.1	4	--[5]
1992	154	1.8	113	1.5	35	4.8	6	1.7
1993	148	1.7	123	1.7	21	3.0	4	--[5]
1994	150	1.8	127	1.7	21	3.1	2	--[5]
1995	121	1.5	96	1.3	15	2.4	10	2.6
1996	113	1.4	80	1.1	30	5.0	3	--[5]
1997	102	1.3	78	1.1	21	3.4	3	--[5]
1998	99	1.2	84	1.2	12	1.9	3	--[5]
1999	86	1.1	69	1.0	14	2.1	3	--[5]
2000	89	1.1	66	0.9	18	2.8	5	1.0
2001	99	1.2	75	1.1	18	2.7	6	1.1
2002	98	1.2	71	1.0	23	3.4	4	--[5]
2003	98	1.2	73	1.1	20	3.0	5	0.9
2004	85	1.1	61	0.9	21	3.1	3	--[5]
2005	109	1.4	82	1.3	18	2.7	7	1.6
2006	90	1.2	68	1.1	19	2.6	3	--[5]
2007	117	1.5	92	1.4	21	2.9	3	--[5]

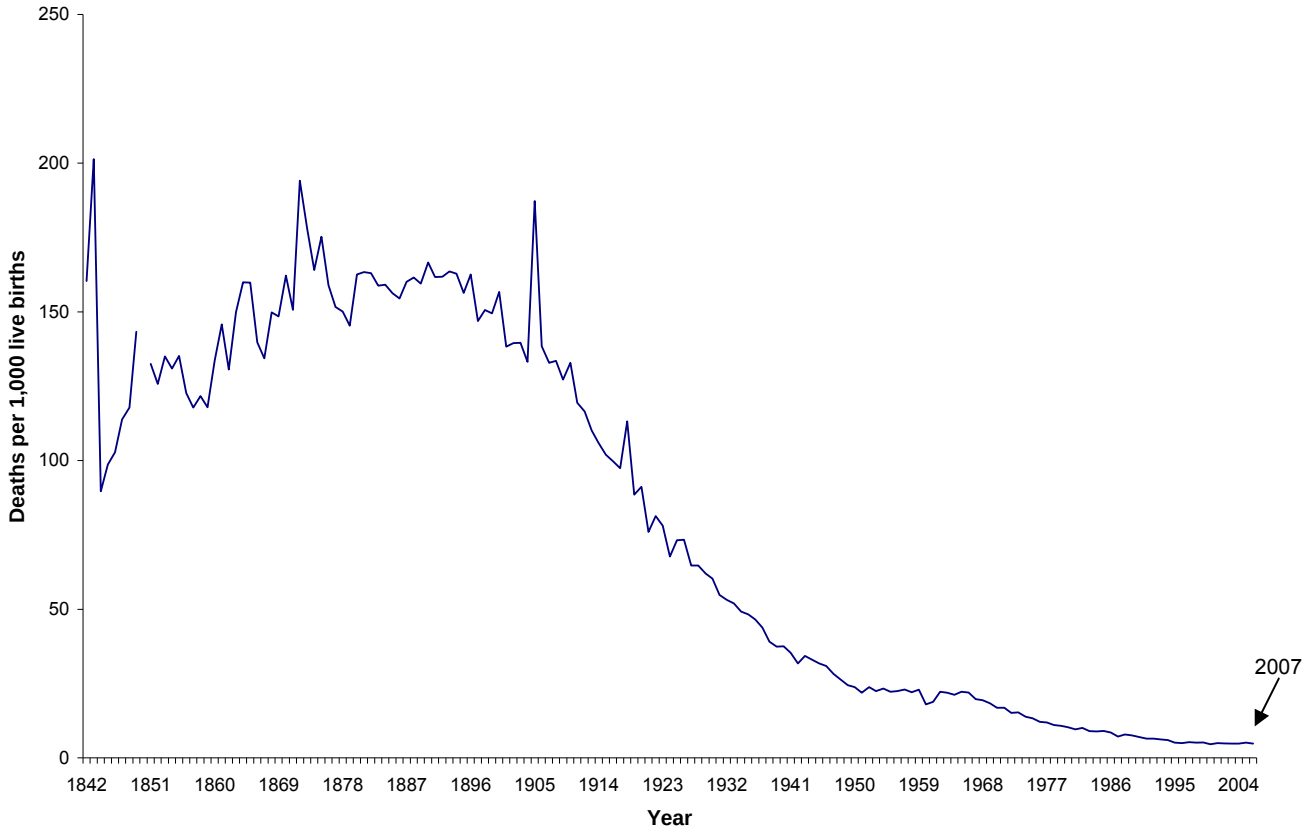
Note that infant deaths are based on a preliminary death file as of the release of this report.
1. Hispanic origin could not be identified from the Massachusetts death certificate before 1989; thus, Hispanic trend data are not available. Most Hispanics are included in the race category of White. Hispanic infant mortality data for the years 1990 through 2005 are presented in Table 11. 2. Deaths of infants of unknown race are included in the total calculation. For rate computations, infants of unknown race are allocated into the race categories according to the distribution of births of known race. 3. Other: American Indian and Other races. 4. Rates are expressed per 1,000 live births. 5. Calculations based on values of 1-4 are excluded.

Figure 16. Infant Mortality Rates and 95% Confidence Intervals[1] by Race[2], Massachusetts: 1980-2007[3]



1. See Technical Notes for explanation. 2. For rate computations, infant births of unknown race are allocated into race categories according to the distribution of the births of known race. 3. On tables and graphs which include data prior to June 1986, the race classifications do not include ethnicity; most Hispanics are included in the race category of whites.

Figure 17. Infant Mortality Rates, Massachusetts: 1842-2007[1]



1. Data not available for 1850.

Figure 18. Trends in the Timing of Infant Deaths, Massachusetts: 1990-2007

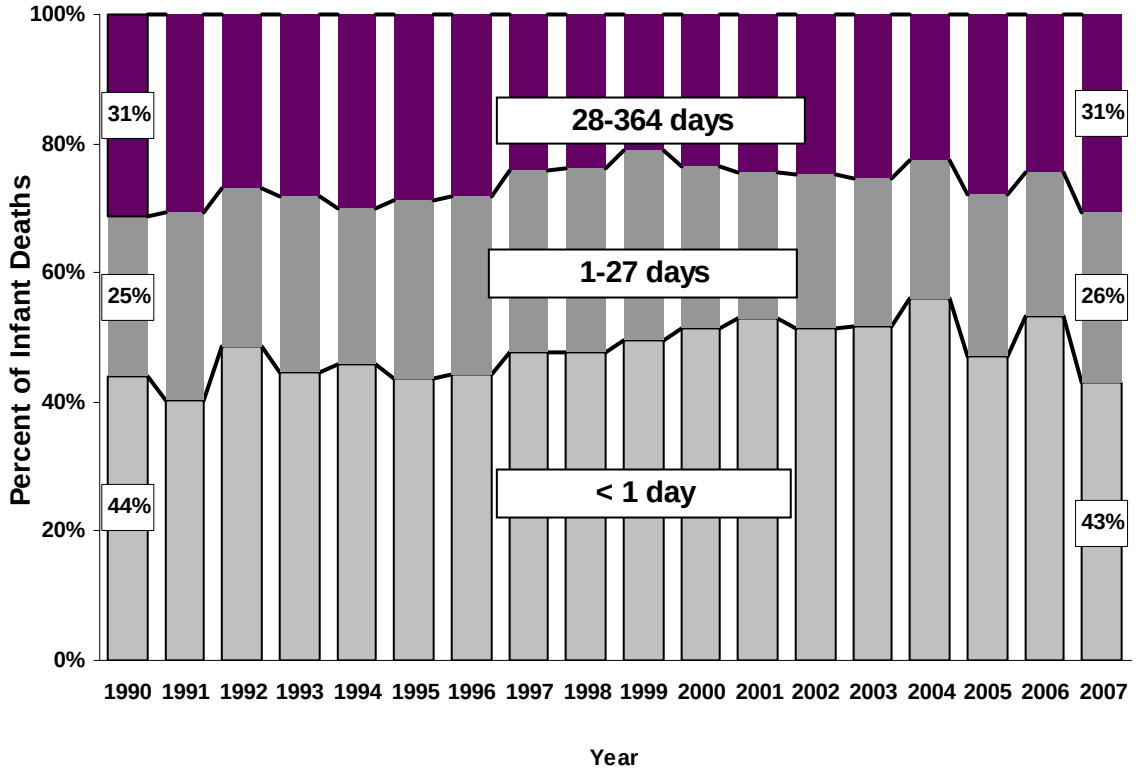
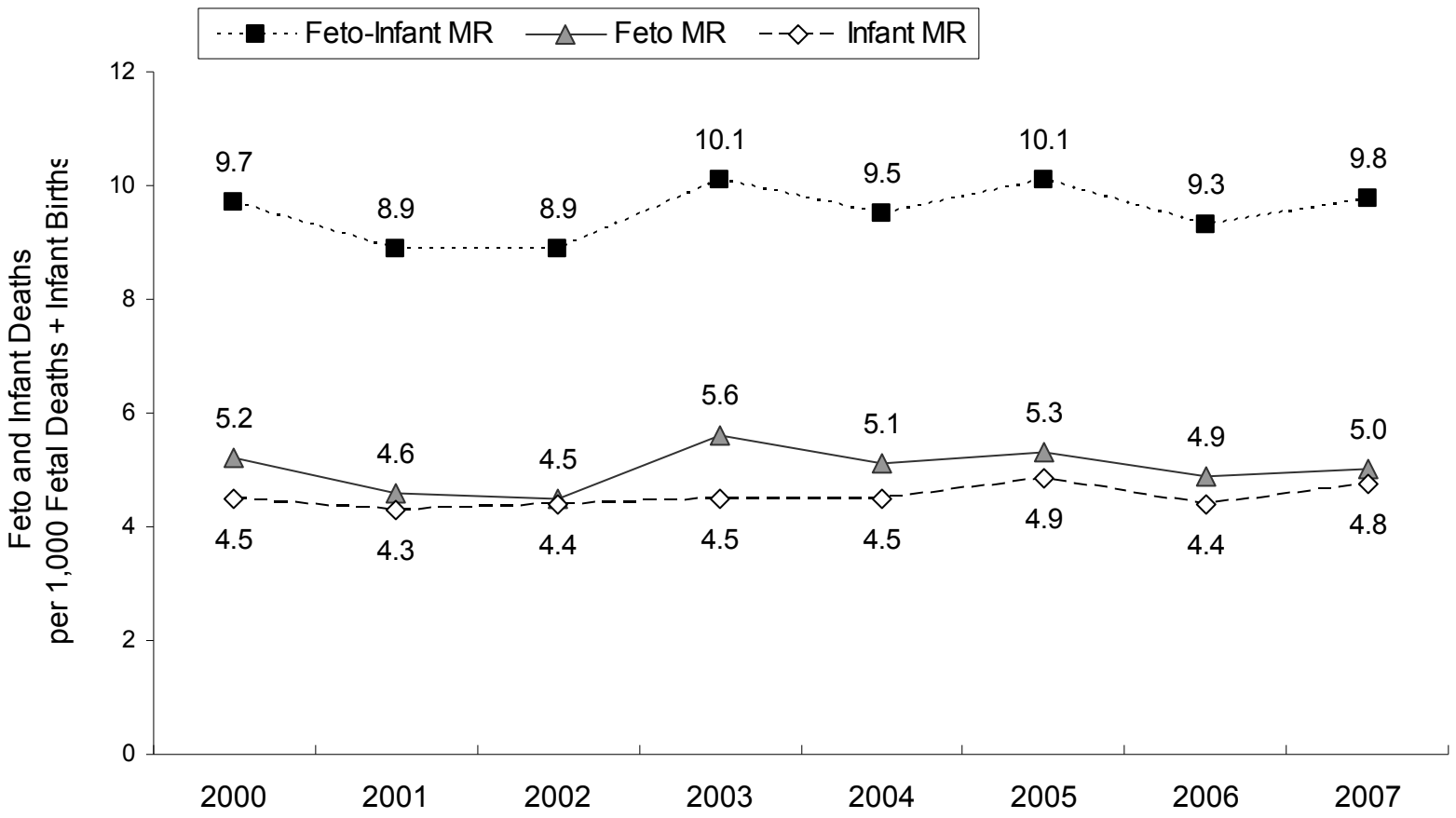


Table 22. Feto-Infant Mortality Rate[1] by Birthweight, Massachusetts: 2000-2007

Birthweight	2000	2001	2002	2003	2004	2005	2006	2007
<500	940.2	938.3	943.5	923.1	912.0	910.9	943.2	934.1
500-749	500.0	487.0	525.5	523.4	561.8	564.7	544.1	487.3
750-999	182.2	146.9	188.6	220.7	157.7	187.8	247.2	282.2
1,000-1,249	125.4	83.0	131.4	142.9	124.1	100.7	112.4	87.3
1,250-1,499	84.6	84.6	95.8	67.7	74.4	73.6	65.8	63.3
1,500-1,999	41.8	40.3	38.3	31.3	38.0	37.2	35.2	39.1
2,000-2,499	15.3	12.2	11.9	16.4	14.8	12.8	15.2	14.6
2,500-4,000	2.2	2.6	2.5	2.3	2.5	2.4	2.4	2.7
4001+	1.5	1.5	1.7	2.5	1.3	2.5	2.3	2.3
Unknown Birthweight	*(37)*	*(23)*	*(17)*	*(30)*	*(19)*	*(11)*	*(34)*	*(10)*
Feto-Infant Mortality Rate[2]	**9.9**	**9.7**	**9.1**	**10.3**	**9.5**	**10.1**	**9.3**	**9.8**

1. Fetal and infant deaths per 1,000 live births plus fetal deaths.
2. Fetal-infant mortality rate is calculated here *excluding* fetal deaths, infant deaths, and births of *unknown birthweight*.

Figure 19. Feto-Infant Mortality Rate, Massachusetts: 2000-2007

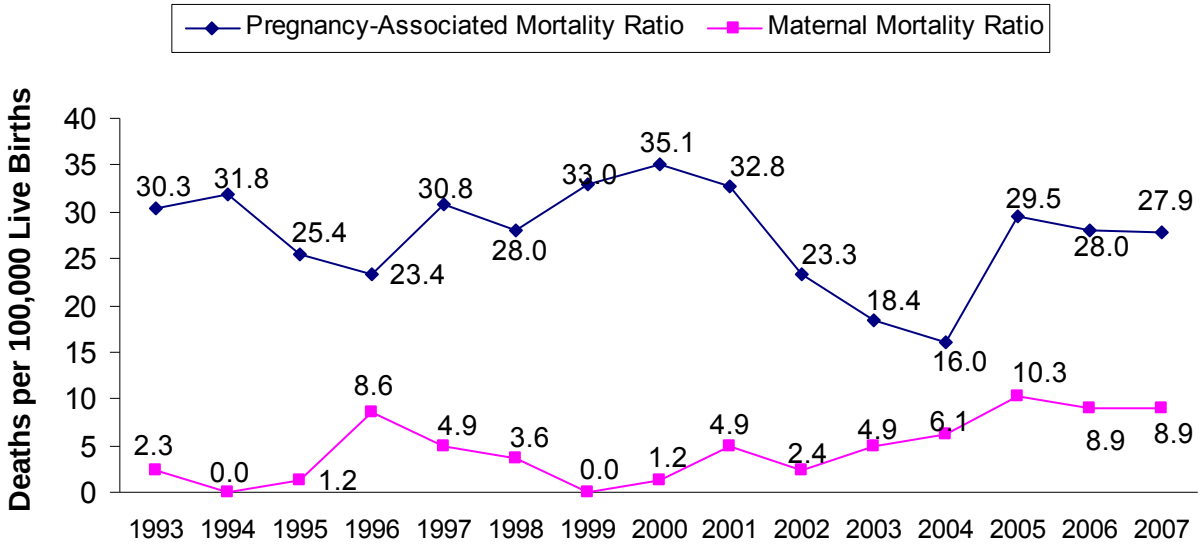


1. Infant Mortality Rate in this graph includes fetal deaths in the denominator unlike the conventional IMR.
2. In this graph, Total Feto, Infant, and Feto-Infant Mortality Rates include all deaths (including those with unknown birthweight). The Fetal Mortality Rate and Infant Mortality Rate may not add up to the Feto-Infant Mortality Rate due to rounding.

Table 23. Fetal and Infant Deaths by Birthweight and Gestational Age, Massachusetts: 1998-2007

Year	Fetals <24 wks or <500 grams	Fetals ≥ 24 wks and ≥ 500 grams	Infants <24 wks or <500 grams	Infants ≥ 24 wks and ≥ 500 grams	Total
1998	216 (25.5%)	219 (25.8%)	183 (21.6%)	230 (27.1%)	848 (100.0%)
1999	214 (25.4%)	215 (25.6%)	196 (23.3%)	216 (25.7%)	841 (100.0%)
2000	203 (25.1%)	234 (28.9%)	168 (20.7%)	205 (25.3%)	810 (100.0%)
2001	174 (22.0%)	214 (27.1%)	197 (24.9%)	206 (26.0%)	791 (100.0%)
2002	165 (22.3%)	210 (28.3%)	185 (25.0%)	181 (24.4%)	741 (100.0%)
2003	218 (26.3%)	246 (29.6%)	189 (22.8%)	177 (21.3%)	830 (100.0%)
2004	177 (22.7%)	240 (30.8%)	182 (23.3%)	181 (23.2%)	780 (100.0%)
2005	210 (26.3%)	213 (26.7%)	174 (21.8%)	201 (25.2%)	798 (100.0%)
2006	178 (24.1%)	210 (28.5%)	173 (23.4%)	177 (24.0%)	738 (100.0%)
2007	184 (23.7%)	215 (27.7%)	149 (19.2%)	227 (29.3%)	775 (100.0%)

Figure 20. Trends in Pregnancy-Associated[1] and Maternal Mortality[2], Massachusetts: 1993-2007



NOTE: Ratios shown in graph are per 100,000 live births. Ratios are based on occurrence births, not resident births.

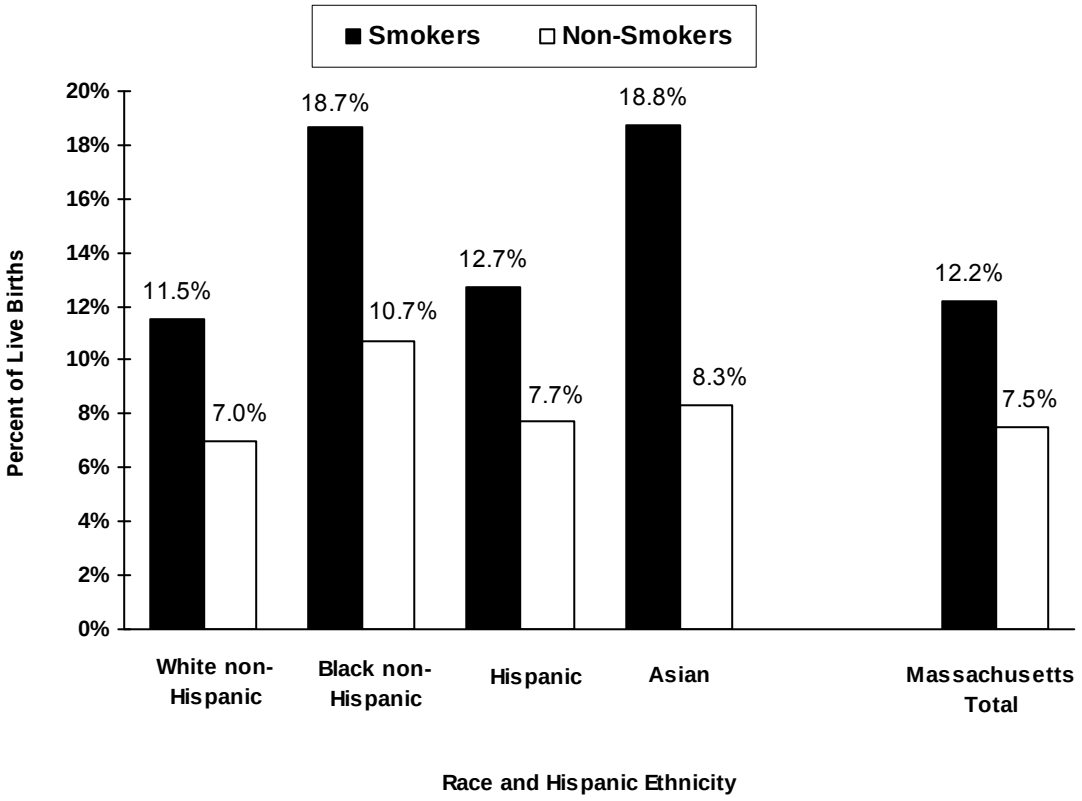
1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. The pregnancy-associated mortality ratio is the number of pregnancy-associated deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for further information). 2. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes. Maternal mortality ratio is the number of maternal deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for more information.)

Table 24. Number of Pregnancy-Associated[1] and Maternal Deaths[2], Massachusetts: 1996-2007

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Pregnancy-Associated Deaths[1]	19	25	23	27	29	27	19	15	13	23	22	22
Maternal Deaths[2]	7	4	3	0	1	4	2	4	5	8	7	7

1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. 2. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes.

Figure 21. Low Birthweight[1] Among Smoking and Non-Smoking[2] Mothers by Race and Hispanic Ethnicity, Massachusetts: 2007



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Maternal smoking is self-reported on the Parent Worksheet of the Birth Certificate; these data should be interpreted cautiously.

1. Low birthweight: less than 2,500 grams or 5.5 pounds. 2. Based on information provided on the Parent Worksheet of the Birth Certificates.

Table 25. Low Birthweight (LBW)[1] by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2007

Mother's Age	Total LBW Infants		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[4]		Unknown[5]
(in years)	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n
State Total[2]	**6,147**	**7.9**	**3,877**	**7.4**	**718**	**11.1**	**866**	**8.0**	**488**	**8.5**	**187**	**8.8**	**11**
<18	187	11.7	57	9.6	32	15.1	82	12.2	12	18.5	4	--[6]	0
18-19	318	9.4	143	8.5	47	11.0	100	9.4	14	12.1	14	13.5	0
20-24	949	7.5	444	6.4	162	11.4	244	7.5	55	10.0	43	8.9	1
25-29	1,496	7.8	933	7.5	192	11.5	182	6.3	134	8.7	52	8.3	3
30-34	1,643	7.1	1,152	6.7	152	10.0	160	8.5	138	6.4	37	7.4	4
35-39	1,200	8.4	873	7.9	101	11.0	77	8.7	119	10.7	30	10.6	0
40+	354	10.5	275	10.6	32	11.0	21	10.4	16	7.2	7	9.7	3

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Low Birthweight (LBW): less than 2,500 grams or 5.5 pounds. 2. State totals include women of unknown age. 3. Percentages are based upon the number of low birthweight infants divided by the total births in each age and race/ethnicity category. 4. Other races include American Indian and others not specified. 5. Race and/or mother's age unknown. 6. Calculations based on values of 1-4 are excluded.

Table 26. Adequacy of Prenatal Care Utilization[1]: Summary and Component Indices, Massachusetts: 2007

	Adequate Total[2]		Adequate Intensive[3]		Adequate Basic[3]		Intermediate[3]		Inadequate[3]		Unknown[3]
	n	%	n	%	n	%	n	%	n	%	n
Summary Index[4]											
Adequacy of Prenatal Care Utilization	63,604	82.8	29,737	38.7	33,867	44.1	6,097	7.9	7,153	9.3	1,080
Component Indices[4]											
Adequacy of Initiation	70,229	91.4	30,339	39.5	39,890	51.9	4,160	5.4	2,465	3.2	1,080
Adequacy of Received Services (Visits)	69,251	90.1	34,147	44.4	35,104	45.7	6,713	8.7	890	1.2	1,080

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic categories. 3. For definitions of these categories, please see the Technical Notes in the Appendix. 4. For an explanation of the APNCU Index (summary index) and its component indices, please see Technical Notes in the Appendix.

Table 27. Adequacy of Prenatal Care[1] by Selected Characteristics, Massachusetts: 2007

	Adequate Total[2]		Adequate Intensive		Adequate Basic		Intermediate		Inadequate		Unknown
	n	%	n	%	n	%	n	%	n	%	n
State Total	**63,604**	**82.8%**	**29,737**	**38.7%**	**33,867**	**44.1%**	**6,097**	**7.9%**	**7,153**	**9.3%**	**1,080**
Maternal Demographics											
Age											
<18	1,024	66.2%	468	30.3%	556	36.0%	163	10.5%	359	23.2%	46
18-19	2,359	70.5%	1,076	32.1%	1,283	38.3%	364	10.9%	624	18.6%	54
20-24	9,382	75.7%	4,228	34.1%	5,154	41.6%	1,187	9.6%	1,826	14.7%	203
25-29	15,579	82.0%	7,313	38.5%	8,266	43.5%	1,625	8.6%	1,801	9.5%	278
30-34	19,941	86.4%	9,109	39.5%	10,832	47.0%	1,703	7.4%	1,424	6.2%	266
35-39	12,430	87.8%	6,024	42.5%	6,406	45.2%	868	6.1%	865	6.1%	173
40+	2,889	86.8%	1,519	45.6%	1,370	41.2%	186	5.6%	254	7.6%	59
Educational Attainment											
< high school	5,795	68.9%	2,761	32.8%	3,034	36.1%	955	11.4%	1,656	19.7%	258
high school	15,214	78.2%	7,140	36.7%	8,074	41.5%	1,814	9.3%	2,430	12.5%	296
some college	14,041	84.2%	7,018	42.1%	7,023	42.1%	1,171	7.0%	1,461	8.8%	295
college	17,549	88.2%	7,791	39.2%	9,758	49.0%	1,375	6.9%	976	4.9%	109
> college	10,916	88.8%	4,983	40.5%	5,933	48.2%	776	6.3%	607	4.9%	46
Race/Ethnicity											
Hispanic	7,991	75.3%	3,659	34.5%	4,332	40.8%	1,134	10.7%	1,491	14.0%	245
White non-Hispanic	44,568	85.4%	21,095	40.4%	23,473	45.0%	3,864	7.4%	3,743	7.2%	445
Black non-Hispanic	4,731	76.1%	2,135	34.3%	2,596	41.8%	486	7.8%	1,000	16.1%	245
Asian	4,657	81.5%	2,111	36.9%	2,546	44.5%	432	7.6%	628	11.0%	41
Other	1,606	77.9%	715	34.7%	891	43.2%	177	8.6%	279	13.5%	62
Birthplace											
U.S. States/D.C.	45,468	84.2%	21,536	39.9%	23,932	44.3%	4,147	7.7%	4,368	8.1%	648
Puerto Rico/U.S. Terr.	1,524	74.1%	733	35.7%	791	38.5%	255	12.4%	277	13.5%	21
Non-U.S.-Born	16,609	79.8%	7,466	35.9%	9,143	43.9%	1,695	8.1%	2,501	12.0%	405
Pregnancy-Related Factors											
Parity[3]											
1	28,671	82.7%	13,125	37.9%	15,546	44.8%	2,753	7.9%	3,252	9.4%	405
2-3	31,039	83.7%	14,659	39.5%	16,380	44.2%	2,928	7.9%	3,099	8.4%	488
4+	3,836	76.1%	1,931	38.3%	1,905	37.8%	412	8.2%	795	15.8%	114
Smoking[4]											
Yes	4,087	71.3%	2,090	36.5%	1,997	34.8%	527	9.2%	1,118	19.5%	91
No	59,434	83.7%	27,605	38.9%	31,829	44.8%	5,564	7.8%	6,013	8.5%	938
Birth Outcomes											
Plurality											
Singleton	60,530	82.4%	27,070	36.8%	33,460	45.5%	6,003	8.2%	6,937	9.4%	1,028
Multiple birth	3,074	90.8%	2,667	78.8%	407	12.0%	94	2.8%	216	6.4%	52
Birthweight											
<500 g	86	87.8%	76	77.6%	10	10.2%	2	--[5]	10	10.2%	17
500-1,499 g	796	89.0%	709	79.3%	87	9.7%	18	2.0%	80	8.9%	44
1,499-2,499 g	4,228	85.1%	3,351	67.4%	877	17.6%	215	4.3%	527	10.6%	124
2,500-3,999 g	52,333	82.4%	23,194	36.5%	29,139	45.9%	5,234	8.2%	5,973	9.4%	771
4,000+ g	6,122	83.8%	2,377	32.5%	3,745	51.2%	628	8.6%	558	7.6%	63
Gestational Age											
<28 weeks	386	87.1%	343	77.4%	43	9.7%	12	2.7%	45	10.2%	37
<37 weeks	5,883	86.8%	5,147	76.0%	736	10.9%	247	3.6%	646	9.5%	204
37-42 weeks	57,691	82.4%	24,576	35.1%	33,115	47.3%	5,846	8.3%	6,492	9.3%	808

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories.
2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on values of 1-4 are excluded.

Table 28. Adequacy of Prenatal Care[1] Initiation by Selected Characteristics, Massachusetts: 2007

	Adequate Total[2]		Adequate Intensive		Adequate Basic		Intermediate		Inadequate		Unknown
	n	%	n	%	n	%	n	%	n	%	n
State Total	**70,229**	**91.4%**	**30,339**	**39.5%**	**39,890**	**51.9%**	**4,160**	**5.4%**	**2,465**	**3.2%**	**1,080**
Maternal Demographics											
Age											
<18	1,206	78.0%	369	23.9%	837	54.1%	228	14.7%	112	7.2%	46
18-19	2,770	82.8%	993	29.7%	1,777	53.1%	376	11.2%	201	6.0%	54
20-24	10,716	86.5%	4,028	32.5%	6,688	54.0%	1,111	9.0%	568	4.6%	203
25-29	17,328	91.2%	7,409	39.0%	9,919	52.2%	1,050	5.5%	627	3.3%	278
30-34	21,760	94.3%	10,045	43.5%	11,715	50.8%	769	3.3%	539	2.3%	266
35-39	13,358	94.3%	6,116	43.2%	7,242	51.1%	485	3.4%	320	2.3%	173
40+	3,090	92.8%	1,378	41.4%	1,712	51.4%	141	4.2%	98	2.9%	59
Educational Attainment											
< high school	6,853	81.5%	2,204	26.2%	4,649	55.3%	1,008	12.0%	545	6.5%	258
high school	17,241	88.6%	6,831	35.1%	10,410	53.5%	1,433	7.4%	784	4.0%	296
some college	15,302	91.8%	6,362	38.2%	8,940	53.6%	868	5.2%	503	3.0%	295
college	18,993	95.4%	9,276	46.6%	9,717	48.8%	540	2.7%	367	1.8%	109
> college	11,743	95.5%	5,641	45.9%	6,102	49.6%	303	2.5%	253	2.1%	46
Race/Ethnicity											
Hispanic	9,218	86.8%	3,700	34.9%	5,518	52.0%	938	8.8%	460	4.3%	245
White non-Hispanic	48,745	93.4%	21,424	41.1%	27,321	52.4%	2,167	4.2%	1,263	2.4%	445
Black non-Hispanic	5,280	84.9%	2,313	37.2%	2,967	47.7%	527	8.5%	410	6.6%	245
Asian	5,129	89.7%	2,074	36.3%	3,055	53.4%	362	6.3%	226	4.0%	41
Other	1,801	87.3%	817	39.6%	984	47.7%	163	7.9%	98	4.8%	62
Birthplace											
U.S. States/D.C.	49,990	92.6%	21,907	40.6%	28,083	52.0%	2,567	4.8%	1,426	2.6%	648
Puerto Rico/U.S. Terr.	1,794	87.3%	664	32.3%	1,130	55.0%	187	9.1%	75	3.6%	21
Non-U.S.-Born	18,442	88.6%	7,766	37.3%	10,676	51.3%	1,404	6.7%	959	4.6%	405
Pregnancy-Related Factors											
Parity[3]											
1	31,673	91.3%	13,816	39.8%	17,857	51.5%	1,877	5.4%	1,126	3.2%	405
2-3	34,204	92.3%	14,809	40.0%	19,395	52.3%	1,824	4.9%	1,038	2.8%	488
4+	4,290	85.1%	1,666	33.0%	2,624	52.0%	454	9.0%	299	5.9%	114
Smoking[4]											
Yes	4,682	81.7%	1,575	27.5%	3,107	54.2%	633	11.0%	417	7.3%	91
No	65,456	92.2%	28,733	40.5%	36,723	51.7%	3,522	5.0%	2,033	2.9%	938
Birth Outcomes											
Plurality											
Singleton	67,051	91.3%	28,798	39.2%	38,253	52.1%	4,020	5.5%	2,399	3.3%	1,028
Multiple birth	3,178	93.9%	1,541	45.5%	1,637	48.4%	140	4.1%	66	2.0%	52
Birthweight											
<500 g	88	89.8%	35	35.7%	53	54.1%	4	--[5]	6	6.1%	17
500-1,499 g	817	91.4%	417	46.6%	400	44.7%	47	5.3%	30	3.4%	44
1,499-2,499 g	4,474	90.0%	2,064	41.5%	2,410	48.5%	316	6.4%	180	3.6%	124
2,500-3,999 g	58,021	91.3%	24,866	39.1%	33,155	52.2%	3,458	5.4%	2,061	3.2%	771
4,000+ g	6,790	92.9%	2,948	40.3%	3,842	52.6%	331	4.5%	187	2.6%	63
Gestational Age											
<28 weeks	401	90.5%	203	45.8%	198	44.7%	21	4.7%	21	4.7%	37
<37 weeks	6,170	91.1%	2,964	43.7%	3,206	47.3%	372	5.5%	234	3.5%	204
37-42 weeks	64,025	91.4%	27,365	39.1%	36,660	52.3%	3,786	5.4%	2,218	3.2%	808

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on values of 1-4 are excluded.

Table 29 Adequacy of Prenatal Care[1] Visits by Selected Characteristics, Massachusetts: 2007

	Adequate Total[2]		Adequate Intensive		Adequate Basic		Intermediate		Inadequate		Unknown
	n	%	n	%	n	%	n	%	n	%	n
State Total	**69,251**	**90.1%**	**34,147**	**44.4%**	**35,104**	**45.7%**	**6,713**	**8.7%**	**890**	**1.2%**	**1,080**
Maternal Demographics											
Age											
<18	1,306	84.5%	676	43.7%	630	40.8%	196	12.7%	44	2.8%	46
18-19	2,841	84.9%	1,431	42.8%	1,410	42.1%	431	12.9%	75	2.2%	54
20-24	10,775	86.9%	5,274	42.5%	5,501	44.4%	1,367	11.0%	253	2.0%	203
25-29	17,013	89.5%	8,435	44.4%	8,578	45.1%	1,786	9.4%	206	1.1%	278
30-34	21,080	91.4%	10,021	43.4%	11,059	47.9%	1,808	7.8%	180	0.8%	266
35-39	13,134	92.7%	6,612	46.7%	6,522	46.0%	928	6.6%	101	0.7%	173
40+	3,102	93.2%	1,698	51.0%	1,404	42.2%	196	5.9%	31	0.9%	59
Educational Attainment											
< high school	7,047	83.8%	3,693	43.9%	3,354	39.9%	1,149	13.7%	210	2.5%	258
high school	17,106	87.9%	8,562	44.0%	8,544	43.9%	2,009	10.3%	343	1.8%	296
some college	15,204	91.2%	7,938	47.6%	7,266	43.6%	1,302	7.8%	167	1.0%	295
college	18,365	92.3%	8,480	42.6%	9,885	49.7%	1,438	7.2%	97	0.5%	109
> college	11,430	92.9%	5,423	44.1%	6,007	48.8%	808	6.6%	61	0.5%	46
Race/Ethnicity											
Hispanic	9,187	86.5%	4,524	42.6%	4,663	43.9%	1,272	12.0%	157	1.5%	245
White non-Hispanic	47,500	91.0%	23,430	44.9%	24,070	46.1%	4,166	8.0%	509	1.0%	445
Black non-Hispanic	5,505	88.5%	2,739	44.1%	2,766	44.5%	588	9.5%	124	2.0%	245
Asian	5,162	90.3%	2,530	44.3%	2,632	46.0%	486	8.5%	69	1.2%	41
Other	1,840	89.2%	897	43.5%	943	45.7%	196	9.5%	26	1.3%	62
Birthplace											
U.S. States/D.C.	48,839	90.5%	24,174	44.8%	24,665	45.7%	4,513	8.4%	631	1.2%	648
Puerto Rico/U.S. Terr.	1,732	84.2%	872	42.4%	860	41.8%	290	14.1%	34	1.7%	21
Non-U.S.-Born	18,675	89.8%	9,097	43.7%	9,578	46.0%	1,909	9.2%	221	1.1%	405
Pregnancy-Related Factors											
Parity[3]											
1	31,276	90.2%	15,184	43.8%	16,092	46.4%	3,011	8.7%	389	1.1%	405
2-3	33,492	90.4%	16,562	44.7%	16,930	45.7%	3,205	8.6%	369	1.0%	488
4+	4,421	87.7%	2,375	47.1%	2,046	40.6%	492	9.8%	130	2.6%	114
Smoking[4]											
Yes	4,893	85.4%	2,708	47.2%	2,185	38.1%	642	11.2%	197	3.4%	91
No	64,264	90.5%	31,389	44.2%	32,875	46.3%	6,064	8.5%	683	1.0%	938
Birth Outcomes											
Plurality											
Singleton	65,994	89.8%	31,313	42.6%	34,681	47.2%	6,605	9.0%	871	1.2%	1,028
Multiple birth	3,257	96.2%	2,834	83.7%	423	12.5%	108	3.2%	19	0.6%	52
Birthweight											
<500 g	90	91.8%	78	79.6%	12	12.2%	2	--[5]	6	6.1%	17
500-1,499 g	850	95.1%	754	84.3%	96	10.7%	19	2.1%	25	2.8%	44
1,499-2,499 g	4,642	93.4%	3,705	74.5%	937	18.9%	258	5.2%	70	1.4%	124
2,500-3,999 g	57,049	89.8%	26,852	42.3%	30,197	47.5%	5,758	9.1%	733	1.2%	771
4,000+ g	6,576	90.0%	2,723	37.3%	3,853	52.7%	676	9.3%	56	0.8%	63
Gestational Age											
<28 weeks	409	92.3%	359	81.0%	50	11.3%	12	2.7%	22	5.0%	37
<37 weeks	6,372	94.0%	5,577	82.3%	795	11.7%	283	4.2%	121	1.8%	204
37-42 weeks	62,844	89.7%	28,552	40.8%	34,292	49.0%	6,426	9.2%	759	1.1%	808

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in the Appendix for definitions of Index and its categories.
2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on values of 1-4 are excluded.

Table 30. Birth Characteristics by Race and Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2007

Race/Ethnicity and Payment Source	Births[1]		Teen Births				Birthweight			
			<18 Years		<20 Years		Very Low[2]		Low[3]	
	n	%	n	%	n	%	n	%	n	%
STATE TOTAL[4]	**77,934**	**100.0**	**1,592**	**2.0**	**4,993**	**6.4**	**1,053**	**1.4**	**6,147**	**7.9**
Public	27,158	35.5	1,183	4.4	3,770	13.9	386	1.4	2,326	8.6
Medicaid[5]	19,785	25.9	897	4.5	2,870	14.5	289	1.5	1,762	8.9
Other Public[6]	7,373	9.7	286	3.9	900	12.2	97	1.3	564	7.6
Private[7]	48,477	63.4	360	0.7	1,097	2.3	581	1.2	3,531	7.3
White non-Hispanic	**52,620**	**100.0**	**591**	**1.1**	**2,283**	**4.3**	**591**	**1.1**	**3,877**	**7.4**
Public	12,519	24.4	380	3.0	1,535	12.3	134	1.1	990	7.9
Medicaid[5]	9,651	18.8	311	3.2	1,264	13.1	96	1.0	749	7.8
Other Public[6]	2,868	5.6	69	2.4	271	9.4	38	1.3	241	8.4
Private[7]	38,321	74.6	189	0.5	678	1.8	407	1.1	2,685	7.0
Black non-Hispanic	**6,462**	**100.0**	**212**	**3.3**	**638**	**9.9**	**171**	**2.6**	**718**	**11.1**
Public	3,894	60.9	158	4.1	482	12.4	88	2.3	456	11.7
Medicaid[5]	2,975	46.5	127	4.3	386	13.0	71	2.4	367	12.3
Other Public[6]	919	14.4	31	3.4	96	10.4	17	1.8	89	9.7
Private[7]	2,446	38.3	44	1.8	143	5.8	69	2.8	235	9.6
Hispanic	**10,861**	**100.0**	**671**	**6.2**	**1,731**	**15.9**	**187**	**1.7**	**866**	**8.0**
Public	7,986	74.0	553	6.9	1,483	18.6	135	1.7	631	7.9
Medicaid[5]	5,070	46.9	378	7.5	982	19.4	99	2.0	441	8.7
Other Public[6]	2,916	27.0	175	6.0	501	17.2	36	1.2	190	6.5
Private[7]	2,728	25.3	105	3.8	215	7.9	44	1.6	213	7.8
Asian	**5,758**	**100.0**	**65**	**1.1**	**181**	**3.1**	**63**	**1.1**	**488**	**8.5**
Public	1,533	26.8	56	3.7	151	9.8	13	0.8	149	9.7
Medicaid[5]	1,206	21.1	52	4.3	141	11.7	11	0.9	123	10.2
Other Public[6]	327	5.7	4	--[8]	10	3.1	2	--[8]	26	8.0
Private[7]	4,137	72.4	7	0.2	27	0.7	49	1.2	323	7.8
Other[9]	**2,124**	**100.0**	**53**	**2.5**	**157**	**7.4**	**37**	**1.7**	**187**	**8.8**
Public	1,208	58.9	36	3.0	117	9.7	16	1.3	98	8.1
Medicaid[5]	869	42.4	29	3.3	95	10.9	12	1.4	81	9.3
Other Public[6]	339	16.5	7	2.1	22	6.5	4	--[8]	17	5.0
Private[7]	812	39.6	15	1.8	33	4.1	12	1.5	72	8.9

Table 30 (cont'd) Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2007

Race/Ethnicity and Payment Source	Prenatal Care: Adequate[10] n	Adequate %	Began 1st Trimester n	Began 1st Trimester %	Cesarean Section n	Cesarean Section %	Breastfeeding[11] n	Breastfeeding %
STATE TOTAL[4]	**63,604**	**82.8**	**63,408**	**82.0**	**26,240**	**33.7**	**60,893**	**79.2**
Public	19,710	74.1	18,999	71.0	8,033	29.6	19,576	72.1
Medicaid[5]	14,535	74.7	14,085	72.0	5,871	29.7	13,976	70.7
Other Public[6]	5,175	72.6	4,914	68.1	2,162	29.3	5,600	76.0
Private[7]	42,510	88.1	42,943	88.8	17,466	36.0	40,433	83.4
White non-Hispanic	**44,568**	**85.4**	**44,822**	**85.5**	**18,454**	**35.1**	**39,980**	**77.3**
Public	9,496	76.5	9,136	73.4	3,904	31.2	8,017	64.1
Medicaid[5]	7,373	77.0	7,074	73.7	2,966	30.7	5,946	61.6
Other Public[6]	2,123	74.9	2,062	72.4	938	32.7	2,071	72.2
Private[7]	33,901	88.7	34,440	90.0	13,954	36.4	31,315	81.7
Black non-Hispanic	**4,731**	**76.1**	**4,535**	**72.2**	**2,234**	**34.6**	**5,331**	**82.9**
Public	2,620	70.9	2,482	66.3	1,239	31.9	3,104	79.8
Medicaid[5]	2,060	72.6	1,970	68.5	940	31.6	2,384	80.2
Other Public[6]	560	65.4	512	58.8	299	32.5	720	78.7
Private[7]	2,070	85.7	2,012	83.0	955	39.1	2,170	88.8
Hispanic	**7,991**	**75.3**	**7,860**	**73.5**	**3,086**	**28.5**	**8,800**	**81.1**
Public	5,624	72.3	5,522	70.4	2,130	26.7	6,313	79.1
Medicaid[5]	3,580	71.7	3,607	72.0	1,414	27.9	4,054	80.0
Other Public[6]	2,044	73.3	1,915	67.5	716	24.6	2,259	77.5
Private[7]	2,304	85.3	2,274	84.0	925	34.0	2,397	87.9
Asian	**4,657**	**81.5**	**4,537**	**79.2**	**1,733**	**30.1**	**4,938**	**86.1**
Public	1,097	72.6	993	65.4	357	23.3	1,102	71.9
Medicaid[5]	874	73.3	794	66.3	269	22.3	854	70.8
Other Public[6]	223	69.9	199	61.8	88	26.9	248	75.8
Private[7]	3,510	85.2	3,497	84.8	1,345	32.5	3,791	91.7
Other[9]	1,606	77.9	1,608	76.9	720	34.0	1,797	87.1
Public	861	72.8	854	71.6	400	33.1	1,027	85.0
Medicaid[5]	638	74.4	629	73.1	279	32.1	728	83.8
Other Public[6]	223	68.4	225	68.0	121	35.7	299	88.2
Private[7]	698	87.1	694	86.1	282	34.8	733	90.4

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. In the "Births" column, percentages are based on race/ethnicity category totals (in column). For all other characteristics, percentages are based on the total number of births for the race/ethnicity by payment source for the row. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low Birthweight: less than 2,500 grams or 5.5 pounds. 4. Total births do not equal Public + Private because Workers' Compensation, self-paid, and other are in the state total but not shown in the table. 5. Medicaid/MassHealth. 6. Other Public: Commonhealth, Healthy Start, Medicare, other government programs, and free care. 7. Private: commercial indemnity plans or commercial managed care organizations (HMO, PPO, IPP, or IPA). 8. Calculations based on values of 1-4 are excluded. 9. Other: Mothers who designated their race as American Indian or "Other." 10. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 11. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

Table 31. Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility[1], All Births, Massachusetts: 2007

Facility	Occurrence Births[2]	Total		Primary C-Section[2]		Repeat C-Sections		VBACs[2]	
		N	%[3,4]	N	%[3,5]	N	%[3,6]	N	%[7]
State Total	78,724	26,522	33.7	16,122	24.0	10,400	91.8	927	8.2
Anna Jaques Hospital	698	206	29.5	124	20.6	82	86.3	13	13.7
Baystate Mary Lane Hospital	180	52	28.9	31	19.5	21	100.0	0	0.0
Baystate Medical Center	4,373	1,373	31.4	840	22.3	533	87.2	78	12.8
Berkshire Medical Center	776	240	30.9	151	22.3	89	89.0	11	11.0
Beth Israel Deaconess Medical Center	4,806	2,016	42.0	1,236	31.3	780	90.5	82	9.5
Beverly Hospital	2,000	647	32.4	378	22.1	269	92.4	22	7.6
Boston Medical Center	2,513	776	30.9	448	20.5	328	99.7	1	--[8]
Brigham And Women's Hospital	8,302	2,818	34.1	1,806	25.5	1,012	85.1	177	14.9
Brockton Hospital	1,449	578	39.9	374	30.5	204	92.3	17	7.7
Cambridge Hospital	1,339	390	29.1	224	19.3	166	91.7	15	8.3
Cape Cod Hospital	1,050	310	29.5	187	20.4	123	93.2	9	6.8
Caritas Good Samaritan Medical Center	899	357	39.7	227	29.7	130	97.0	4	--[8]
Caritas Holy Family Hospital and Medical Center	1,197	513	42.9	295	30.2	218	98.6	3	--[8]
Caritas Norwood Hospital	547	217	39.7	133	29.6	84	86.6	13	13.4
Caritas St. Elizabeth's Medical Center of Boston	1,229	496	40.4	321	31.1	175	88.8	22	11.2
Charlton Memorial Hospital	1,657	557	33.7	345	23.9	212	99.5	1	--[8]
Cooley Dickinson Hospital	836	228	27.3	145	19.7	83	83.8	16	16.2
Emerson Hospital	1,131	424	37.5	243	26.1	181	90.5	19	9.5
Fairview Hospital	158	44	27.8	31	21.4	13	100.0	0	0.0
Falmouth Hospital	633	229	36.3	127	24.1	102	99.0	1	--[8]
Franklin Medical Center	529	112	21.2	69	14.7	43	70.5	18	29.5
Harrington Memorial Hospital	412	145	35.2	90	25.4	55	96.5	2	--[8]
Heywood Memorial Hospital	589	111	18.8	58	11.0	53	86.9	8	13.1
Holyoke Hospital	616	118	19.2	75	13.3	43	84.3	8	15.7
Jordan Hospital	725	233	32.1	137	22.1	96	92.3	8	7.7
Lawrence General Hospital	1,887	632	33.5	316	20.1	316	99.4	2	--[8]
Leominster Hospital	1,112	275	24.7	149	15.3	126	92.0	11	8.0
Lowell General Hospital	1,938	620	32.0	369	22.1	251	93.3	18	6.7
Martha's Vineyard Hospital	180	56	31.1	28	18.4	28	100.0	0	0.0
Massachusetts General Hospital	3,504	1,146	32.7	743	24.4	403	88.2	54	11.8
Melrose-Wakefield Hospital	1,245	544	43.7	344	32.9	200	100.0	0	0.0
Mercy Medical Center	1,237	343	27.7	195	18.1	148	92.5	12	7.5

Table 31 (cont'd.) Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility[1], All Births, Massachusetts: 2007

Facility	Occurrence Births[2]	Total		Primary C-Section[2]		Repeat C-Sections		VBACs[2]	
		N	%[3,4]	N	%[3,5]	N	%[3,6]	N	%[7]
Metrowest Medical Center-Framingham Union Campus	1,923	804	41.8	462	29.2	342	100.0	0	0.0
Milford Regional Medical Center	1,075	418	38.9	246	27.5	172	95.6	8	4.4
Morton Hospital	497	166	33.5	110	25.2	56	94.9	3	--[8]
Mount Auburn Hospital	2,103	579	27.5	405	21.4	174	82.9	36	17.1
Nantucket Cottage Hospital	151	44	29.1	31	22.6	13	92.9	1	--[8]
Newton Wellesley Hospital	3,397	1,262	37.2	746	26.2	516	94.7	29	5.3
North Adams Regional Hospital	289	65	22.5	33	12.9	32	97.0	1	--[8]
North Shore Medical Center - Salem Hospital	1,792	544	30.4	329	21.2	215	88.8	27	11.2
Saint Vincent Hospital	1,856	532	28.7	330	20.4	202	86.0	33	14.0
Saints Memorial Medical Center	660	231	35.2	127	23.1	104	98.1	2	--[8]
South Shore Hospital	3,805	1,685	44.3	1,028	33.1	657	93.5	46	6.5
St. Luke's Hospital	1,568	493	31.7	301	22.1	192	100.0	0	0.0
Sturdy Memorial Hospital	1,017	365	35.9	222	25.7	143	94.1	9	5.9
Tobey Hospital	415	71	17.1	48	12.4	23	82.1	5	17.9
Tufts-New England Medical Center Hospital	1,409	531	37.7	351	29.0	180	90.9	18	9.1
UMASS Memorial Medical Center - West Campus	4,386	1,199	27.3	699	18.2	500	91.9	44	8.1
Winchester Hospital	2,044	721	35.3	409	23.8	312	97.5	8	2.5

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births, primary and repeat Cesarean sections, and VBACs. The percentages provided in this table are based on occurrence births, and may differ from data which are based on resident births, presented elsewhere in this book. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Percentage of total Cesarean sections= (total Cesarean births/all births) x 100. 5. Percentage primary Cesarean sections= (primary Cesarean sections/all births-repeat Cesarean sections-VBACs) x 100. 6. Percentage repeat Cesarean sections= (repeat Cesarean sections/ (repeat Cesarean sections + VBACs)) x100. 7. Percentage VBACs= (VBAC deliveries/ (repeat Cesarean sections + VBAC)) x 100. 8. Calculations based on values of 1-4 are excluded.

Table 32. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2007

Facility[1]	First Birth			Second or Later Birth without prior C-section			Second or Later Birth with prior C-section		
	Births[2]	C-section		Births[2]	C-section		Births[2]	C-section	
		n	%[3]		n	%[3]		n	%[3]
State Total	**34,402**	**11,124**	**32.3**	**29,885**	**2,884**	**9.7**	**10,690**	**9,789**	**91.6**
Anna Jaques Hospital	304	94	30.9	277	17	6.1	92	79	85.9
Baystate Mary Lane Hospital	69	19	27.5	84	9	10.7	21	21	100.0
Baystate Medical Center	1,748	502	28.7	1,803	193	10.7	584	509	87.2
Berkshire Medical Center	348	110	31.6	302	21	7.0	98	87	88.8
Beth Israel Deaconess Medical Center	2,048	788	38.5	1,579	177	11.2	780	703	90.1
Beverly Hospital	817	267	32.7	822	65	7.9	279	257	92.1
Boston Medical Center	1,013	279	27.5	1,123	139	12.4	323	322	99.7
Brigham And Women's Hospital	3,701	1,127	30.5	2,829	254	9.0	1,008	844	83.7
Brockton Hospital	652	273	41.9	546	82	15.0	213	196	92.0
Cambridge Hospital	715	187	26.2	435	34	7.8	181	166	91.7
Cape Cod Hospital	468	129	27.6	422	34	8.1	129	120	93.0
Caritas Good Samaritan Medical Center	365	159	43.6	368	44	12.0	133	129	97.0
Caritas Holy Family Hospital and Medical Center	519	227	43.7	437	50	11.4	214	211	98.6
Caritas Norwood Hospital	253	107	42.3	185	21	11.4	93	80	86.0
Caritas St. Elizabeth's Medical Center Of Boston	534	212	39.7	432	58	13.4	183	161	88.0
Charlton Memorial Hospital	765	239	31.2	638	82	12.9	207	206	99.5
Cooley Dickinson Hospital	412	112	27.2	307	21	6.8	97	81	83.5
Emerson Hospital	481	187	38.9	414	30	7.2	189	170	89.9
Fairview Hospital	80	27	33.8	65	4	6.2	13	13	100.0
Falmouth Hospital	266	91	34.2	249	28	11.2	97	96	99.0
Franklin Medical Center	258	53	20.5	206	14	6.8	61	43	70.5
Harrington Memorial Hospital	189	71	37.6	158	15	9.5	55	53	96.4
Heywood Memorial Hospital	252	46	18.3	256	10	3.9	61	53	86.9
Holyoke Hospital	301	42	14.0	256	29	11.3	51	43	84.3
Jordan Hospital	332	111	33.4	284	22	7.7	104	96	92.3
Lawrence General Hospital	760	209	27.5	766	81	10.6	308	306	99.4
Leominster Hospital	442	105	23.8	521	38	7.3	132	122	92.4
Lowell General Hospital	831	257	30.9	792	76	9.6	247	229	92.7
Martha's Vineyard Hospital	86	17	19.8	56	5	8.9	28	28	100.0
Massachusetts General Hospital	1,588	490	30.9	1,279	120	9.4	432	378	87.5
Melrose-Wakefield Hospital	566	250	44.2	450	73	16.2	190	190	100.0
Mercy Medical Center	485	140	28.9	582	49	8.4	156	144	92.3
Metrowest Medical Center-Framingham Union Campus	840	366	43.6	698	70	10.0	327	327	100.0
Milford Regional Medical Center	488	172	35.2	374	49	13.1	177	169	95.5
Morton Hospital	220	79	35.9	215	30	14.0	55	52	94.5
Mount Auburn Hospital	1,068	313	29.3	757	48	6.3	204	168	82.4
Nantucket Cottage Hospital	73	28	38.4	64	3	--[4]	14	13	92.9

Table 32 (cont'd). Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2007

Facility[1]	First Birth			Second or Later Birth without prior C-section			Second or Later Birth with prior C-section		
	Births[2]	C-section		Births[2]	C-section		Births[2]	C-section	
		n	%[3]		n	%[3]		n	%[3]
Newton Wellesley Hospital	1,528	568	37.2	1,197	97	8.1	522	495	94.8
North Adams Regional Hospital	117	26	22.2	132	6	4.5	31	30	96.8
North Shore Medical Center - Salem Hospital	748	230	30.7	749	68	9.1	221	196	88.7
Saint Vincent Hospital	819	242	29.5	764	60	7.9	226	193	85.4
Saints Memorial Medical Ctr.-St. John's Campus	279	96	34.4	261	29	11.1	102	100	98.0
South Shore Hospital	1,550	689	44.5	1,372	180	13.1	677	631	93.2
St. Luke's Hospital	676	215	31.8	651	76	11.7	188	188	100.0
Sturdy Memorial Hospital	452	181	40.0	383	28	7.3	148	139	93.9
Tobey Hospital	190	27	14.2	186	11	5.9	28	23	82.1
Tufts-New England Medical Center Hospital	587	204	34.8	496	72	14.5	181	163	90.1
UMASS Memorial Medical Center - West Campus	2,099	481	22.9	1,508	87	5.8	509	465	91.4
Winchester Hospital	864	279	32.3	780	71	9.1	309	301	97.4

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Calculations based on 1-4 events are excluded.

Table 33. Birth Characteristics[1]: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
STATE TOTAL	**78,724**	**77,934**	**6,147**	**4,944**	**380**	**263**	**399**
ABINGTON	0	213	7	9	2	1	0
ACTON	1	187	12	--	1	0	0
ACUSHNET	0	89	8	--	0	0	0
ADAMS	1	99	13	11	0	0	--
AGAWAM	0	281	15	10	0	0	0
ALFORD	0	1	0	0	0	0	--
AMESBURY	1	200	22	12	1	0	--
AMHERST	4	175	12	11	0	0	0
ANDOVER	0	326	29	5	5	4	--
ARLINGTON	6	577	31	--	1	1	--
ASHBURNHAM	0	67	--	--	0	0	0
ASHBY	0	43	5	5	1	1	0
ASHFIELD	1	18	0	0	0	0	0
ASHLAND	0	248	25	--	0	0	--
ATHOL	0	133	10	16	1	0	--
ATTLEBORO	1,019	583	46	35	2	2	--
AUBURN	0	147	11	8	0	0	--
AVON	0	42	6	0	0	0	0
AYER	0	105	14	6	1	1	0
BARNSTABLE	1,054	478	32	26	5	2	0
BARRE	0	52	--	--	0	0	0
BECKET	0	13	0	--	0	0	0
BEDFORD	0	150	13	--	0	0	0
BELCHERTOWN	1	157	9	--	0	0	0
BELLINGHAM	0	216	13	--	1	0	--
BELMONT	1	298	28	--	2	2	5
BERKLEY	0	62	8	5	0	0	--
BERLIN	0	19	--	0	0	0	0
BERNARDSTON	0	17	0	0	0	0	0
BEVERLY	2,112	422	22	9	1	0	--
BILLERICA	1	448	26	13	2	2	--
BLACKSTONE	0	90	9	5	0	0	0
BLANDFORD	0	5	0	--	0	0	0
BOLTON	1	53	--	--	0	0	0
BOSTON	21,816	7,855	751	588	50	37	44
BOURNE	0	193	18	8	0	0	0
BOXBOROUGH	0	51	7	--	1	1	0
BOXFORD	0	47	--	0	0	0	0
BOYLSTON	0	53	6	0	0	0	0
BRAINTREE	2	419	34	5	3	2	--
BREWSTER	0	68	--	--	0	0	0
BRIDGEWATER	1	233	18	10	2	1	--
BRIMFIELD	0	33	--	0	0	0	0
BROCKTON	2,354	1,584	158	171	12	6	12

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
BROOKFIELD	0	44	--	8	0	0	0
BROOKLINE	4	668	51	5	1	1	--
BUCKLAND	0	13	--	--	0	0	0
BURLINGTON	2	300	22	0	1	1	--
CAMBRIDGE	3,553	1,220	73	25	3	3	9
CANTON	0	229	14	--	1	0	--
CARLISLE	2	35	--	0	0	0	0
CARVER	0	120	6	--	0	0	--
CHARLEMONT	0	17	0	0	0	0	0
CHARLTON	0	140	6	9	0	0	--
CHATHAM	0	39	--	--	0	0	--
CHELMSFORD	0	328	26	5	0	0	0
CHELSEA	1	700	70	82	2	2	--
CHESHIRE	0	32	--	--	0	0	--
CHESTER	1	7	--	--	0	0	0
CHESTERFIELD	1	10	0	0	0	0	0
CHICOPEE	1	604	47	76	4	2	--
CHILMARK	0	9	0	0	0	0	0
CLARKSBURG	1	10	0	--	0	0	--
CLINTON	3	206	9	13	0	0	--
COHASSET	0	76	6	0	0	0	0
COLRAIN	2	15	0	--	0	0	0
CONCORD	1,131	94	5	--	0	0	0
CONWAY	0	10	0	--	0	0	0
CUMMINGTON	0	5	0	0	0	0	0
DALTON	0	46	5	--	0	0	0
DANVERS	0	230	17	6	2	2	0
DARTMOUTH	1	229	17	8	1	0	0
DEDHAM	0	271	24	6	0	0	--
DEERFIELD	1	33	--	--	0	0	0
DENNIS	0	148	5	8	0	0	0
DIGHTON	0	77	5	0	0	0	0
DOUGLAS	0	108	--	--	0	0	0
DOVER	0	33	--	0	0	0	0
DRACUT	1	366	18	15	0	0	--
DUDLEY	2	112	8	5	3	3	0
DUNSTABLE	0	31	--	--	0	0	0
DUXBURY	0	119	--	--	1	0	0
E. BRIDGEWATER	1	145	7	7	0	0	--
E. BROOKFIELD	0	30	--	--	0	0	0
E. LONGMEADOW	0	125	--	--	0	0	0
EASTHAM	0	40	--	--	0	0	0
EASTHAMPTON	2	154	12	9	2	1	0
EASTON	0	208	14	--	1	1	0
EDGARTOWN	0	44	--	--	0	0	0
EGREMONT	1	7	0	0	0	0	0
ERVING	0	16	--	--	0	0	0

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
ESSEX	0	28	--	0	0	0	--
EVERETT	3	648	55	43	2	2	--
FAIRHAVEN	0	142	11	12	1	1	0
FALL RIVER	1,659	1,219	97	167	16	14	7
FALMOUTH	635	264	18	14	3	2	--
FITCHBURG	1	574	49	71	1	1	--
FLORIDA	0	6	0	0	0	0	0
FOXBOROUGH	3	176	20	6	1	1	--
FRAMINGHAM	1,930	1,017	64	40	1	1	5
FRANKLIN	1	364	27	7	0	0	0
FREETOWN	0	75	6	--	0	0	0
GARDNER	590	283	26	30	6	3	--
AQUINNAH	0	3	0	0	0	0	0
GEORGETOWN	0	76	--	--	0	0	0
GILL	1	8	0	0	0	0	0
GLOUCESTER	0	260	21	15	0	0	--
GOSHEN	0	9	0	0	0	0	0
GOSNOLD	0	0	0	0	0	0	0
GRAFTON	2	263	13	5	0	0	--
GRANBY	0	48	--	--	0	0	0
GRANVILLE	0	8	--	--	0	0	0
GREAT BARRINGTON	159	60	--	--	0	0	0
GREENFIELD	531	192	14	24	0	0	0
GROTON	1	82	7	--	0	0	0
GROVELAND	1	52	0	--	1	1	0
HADLEY	2	40	0	--	0	0	--
HALIFAX	0	85	7	--	0	0	0
HAMILTON	0	100	6	--	0	0	0
HAMPDEN	0	30	7	--	0	0	0
HANCOCK	0	3	0	--	0	0	0
HANOVER	0	114	--	--	0	0	0
HANSON	0	93	8	--	0	0	0
HARDWICK	2	23	0	--	0	0	0
HARVARD	0	31	--	0	0	0	0
HARWICH	0	100	5	5	0	0	0
HATFIELD	1	27	--	--	0	0	0
HAVERHILL	3	928	71	67	4	3	--
HAWLEY	0	1	0	0	0	0	0
HEATH	0	5	0	0	0	0	0
HINGHAM	1	232	17	--	1	1	0
HINSDALE	0	8	0	0	0	0	0
HOLBROOK	0	134	12	9	0	0	0
HOLDEN	1	188	10	--	1	1	0
HOLLAND	0	28	0	--	0	0	0
HOLLISTON	1	133	7	5	0	0	0
HOLYOKE	618	640	58	144	6	5	7
HOPEDALE	1	57	--	--	0	0	0

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
HOPKINTON	1	166	12	0	0	0	--
HUBBARDSTON	3	40	--	0	0	0	0
HUDSON	0	247	19	9	2	2	--
HULL	0	84	9	5	0	0	0
HUNTINGTON	2	18	--	--	0	0	0
IPSWICH	0	117	10	0	1	1	0
KINGSTON	0	152	--	5	0	0	0
LAKEVILLE	0	84	8	5	1	1	--
LANCASTER	1	54	--	--	0	0	--
LANESBOROUGH	0	18	0	--	0	0	0
LAWRENCE	1,890	1,419	140	230	8	6	12
LEE	0	32	--	--	0	0	0
LEICESTER	1	96	6	8	0	0	--
LENOX	0	37	--	0	0	0	0
LEOMINSTER	1,113	517	44	46	2	2	--
LEVERETT	2	8	0	0	0	0	0
LEXINGTON	0	199	14	--	1	0	--
LEYDEN	0	5	--	--	0	0	0
LINCOLN	0	72	5	0	0	0	0
LITTLETON	0	105	--	--	0	0	--
LONGMEADOW	1	118	8	0	0	0	--
LOWELL	2,604	1,833	155	215	10	8	10
LUDLOW	0	171	8	7	0	0	--
LUNENBURG	0	91	--	5	2	2	0
LYNN	12	1,550	135	175	12	9	11
LYNNFIELD	0	92	10	0	1	1	0
MALDEN	1	915	84	37	4	3	--
MANCHESTER	1	48	--	0	0	0	0
MANSFIELD	0	260	18	--	0	0	--
MARBLEHEAD	2	170	9	--	0	0	0
MARION	0	34	--	--	0	0	--
MARLBOROUGH	2	576	31	22	5	4	--
MARSHFIELD	1	274	17	6	0	0	--
MASHPEE	0	146	6	13	0	0	0
MATTAPOISETT	0	46	--	--	0	0	0
MAYNARD	1	155	14	--	0	0	--
MEDFIELD	0	100	--	0	0	0	0
MEDFORD	3	684	61	21	2	1	--
MEDWAY	0	118	--	5	0	0	--
MELROSE	1,246	342	30	--	0	0	--
MENDON	1	57	--	0	0	0	--
MERRIMAC	1	42	7	--	0	0	0
METHUEN	1,198	608	52	39	1	1	--
MIDDLEBOROUGH	0	275	15	15	0	0	--
MIDDLEFIELD	0	4	0	0	0	0	0
MIDDLETON	0	65	8	0	1	1	--
MILFORD	1,077	450	32	19	1	0	6

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
MILLBURY	0	143	10	--	0	0	--
MILLIS	0	88	--	--	1	1	--
MILLVILLE	0	42	--	--	0	0	0
MILTON	0	282	11	5	1	1	0
MONROE	0	1	0	0	0	0	0
MONSON	0	70	--	--	0	0	--
MONTAGUE	3	104	8	7	0	0	--
MONTEREY	1	7	0	0	0	0	0
MONTGOMERY	0	5	0	--	0	0	0
MOUNT WASHINGTON	0	1	0	0	0	0	0
NAHANT	0	19	--	0	0	0	0
NANTUCKET	151	184	12	5	0	0	--
NATICK	1	452	29	6	4	4	--
NEEDHAM	0	298	12	--	3	2	--
NEW ASHFORD	0	2	0	0	0	0	0
NEW BEDFORD	1,574	1,380	143	197	12	8	--
NEW BRAINTREE	0	9	0	--	0	0	0
NEW MARLBOROUGH	0	9	--	0	0	0	0
NEW SALEM	1	6	--	0	0	0	0
NEWBURY	0	60	--	--	0	0	0
NEWBURYPORT	699	164	15	6	0	0	--
NEWTON	3,404	815	69	--	2	2	--
NORFOLK	0	93	11	--	0	0	--
NORTH ADAMS	290	167	12	23	1	1	0
NORTH ANDOVER	0	316	24	5	0	0	0
NORTH ATTLEBORO	3	365	34	8	0	0	--
NORTH BROOKFIELD	0	51	--	--	0	0	0
NORTH READING	0	139	12	--	0	0	0
NORTHAMPTON	848	224	15	6	2	2	0
NORTHBOROUGH	2	125	13	--	0	0	0
NORTHBRIDGE	0	220	10	15	0	0	--
NORTHFIELD	0	30	--	--	0	0	0
NORTON	0	195	11	5	0	0	--
NORWELL	1	99	5	--	0	0	0
NORWOOD	550	362	30	12	3	2	--
OAK BLUFFS	180	61	--	--	0	0	--
OAKHAM	0	14	--	0	0	0	0
ORANGE	0	114	12	11	0	0	--
ORLEANS	0	46	--	--	0	0	--
OTIS	1	11	0	0	0	0	0
OXFORD	3	136	9	7	0	0	--
PALMER	0	135	15	12	1	1	0
PAXTON	0	52	6	--	0	0	0
PEABODY	1	497	47	22	3	2	--
PELHAM	0	7	0	0	1	1	0
PEMBROKE	0	176	11	5	2	2	--

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
PEPPERELL	2	111	7	7	0	0	0
PERU	0	8	0	0	0	0	0
PETERSHAM	0	8	--	0	0	0	0
PHILLIPSTON	1	17	--	--	0	0	0
PITTSFIELD	779	561	60	67	1	1	--
PLAINFIELD	0	5	0	0	0	0	0
PLAINVILLE	0	101	7	--	0	0	0
PLYMOUTH	731	715	40	35	2	0	5
PLYMPTON	0	22	0	0	0	0	0
PRINCETON	0	29	--	--	0	0	0
PROVINCETOWN	0	15	--	--	0	0	0
QUINCY	2	1,203	91	38	4	0	6
RANDOLPH	0	412	38	19	5	3	0
RAYNHAM	0	158	6	8	0	0	--
READING	1	258	22	--	2	2	--
REHOBOTH	0	90	7	5	0	0	--
REVERE	1	787	70	48	7	5	--
RICHMOND	0	4	0	0	0	0	0
ROCHESTER	0	31	--	--	0	0	--
ROCKLAND	0	232	16	12	1	0	--
ROCKPORT	0	50	--	--	0	0	0
ROWE	0	4	0	0	0	0	0
ROWLEY	0	61	6	--	0	0	0
ROYALSTON	0	11	0	0	0	0	0
RUSSELL	0	21	0	--	0	0	0
RUTLAND	0	92	13	--	3	3	0
SALEM	1,794	510	46	31	4	3	--
SALISBURY	0	96	9	10	2	0	--
SANDISFIELD	0	6	0	0	0	0	0
SANDWICH	0	174	9	--	0	0	0
SAUGUS	0	262	18	6	2	1	0
SAVOY	0	2	0	0	0	0	0
SCITUATE	1	166	12	--	1	0	0
SEEKONK	0	107	5	--	0	0	0
SHARON	2	155	11	--	0	0	--
SHEFFIELD	0	35	0	--	0	0	0
SHELBURNE	1	13	--	--	1	0	0
SHERBORN	0	18	--	0	0	0	0
SHIRLEY	0	61	--	--	1	0	0
SHREWSBURY	2	364	26	--	0	0	--
SHUTESBURY	5	12	--	--	0	0	0
SOMERSET	0	140	9	7	2	2	--
SOMERVILLE	6	964	65	24	8	7	7
SOUTH HADLEY	1	140	7	5	0	0	--
SOUTHAMPTON	0	51	--	--	0	0	--

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
SOUTHBOROUGH	0	98	7	0	1	1	--
SOUTHBRIDGE	413	266	37	43	1	0	--
SOUTHWICK	0	84	11	--	0	0	--
SPENCER	1	143	7	10	0	0	0
SPRINGFIELD	5,627	2,535	263	512	20	12	21
STERLING	0	70	5	--	0	0	0
STOCKBRIDGE	0	13	--	0	1	0	0
STONEHAM	0	229	15	--	0	0	0
STOUGHTON	1	352	40	9	1	1	--
STOW	1	73	--	--	0	0	0
STURBRIDGE	2	106	13	--	1	1	0
SUDBURY	2	164	17	--	0	0	--
SUNDERLAND	1	36	0	--	0	0	0
SUTTON	1	96	9	--	0	0	--
SWAMPSCOTT	0	146	10	--	1	1	0
SWANSEA	0	156	12	--	0	0	0
TAUNTON	499	750	38	55	4	3	--
TEMPLETON	2	97	--	5	2	2	0
TEWKSBURY	0	291	20	9	0	0	--
TISBURY	2	59	--	0	1	1	0
TOLLAND	0	3	0	0	0	0	0
TOPSFIELD	0	43	--	0	0	0	0
TOWNSEND	3	94	11	--	0	0	0
TRURO	0	13	0	--	0	0	0
TYNGSBOROUGH	0	103	9	--	1	1	0
TYRINGHAM	0	0	0	0	0	0	0
UPTON	0	72	--	0	0	0	0
UXBRIDGE	0	197	13	9	1	0	0
WAKEFIELD	1	296	28	--	1	1	0
WALES	0	18	--	0	1	1	0
WALPOLE	1	259	14	--	0	0	--
WALTHAM	0	783	62	31	0	0	--
WARE	182	138	11	18	1	0	--
WAREHAM	417	231	15	25	1	0	--
WARREN	3	60	5	6	1	0	--
WARWICK	0	4	0	0	0	0	0
WASHINGTON	0	6	--	0	0	0	0
WATERTOWN	1	403	22	--	0	0	0
WAYLAND	0	112	7	--	0	0	0
WEBSTER	1	221	18	17	2	2	0
WELLESLEY	0	252	19	--	0	0	0
WELLFLEET	1	25	--	0	0	0	0
WENDELL	0	8	0	0	0	0	0
WENHAM	0	33	--	0	0	0	0
WEST BOYLSTON	0	57	--	--	0	0	0
WEST BRIDGEWATER	0	62	--	--	0	0	--

Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2007

Community	Occurrence Births[2]	Resident Births[3]	Low Birthweight[4]	Teen Births (15-19 years)	Infant Deaths[5]	Neonatal Deaths[6]	Fetal Deaths[7]
WEST BROOKFIELD	0	32	--	--	2	0	0
WEST NEWBURY	0	34	6	--	1	1	0
WEST SPRINGFIELD	1	333	32	26	1	1	--
WEST STOCKBRIDGE	0	6	0	0	0	0	0
WEST TISBURY	0	28	0	0	0	0	0
WESTBOROUGH	1	202	9	5	1	1	--
WESTFIELD	2	451	36	35	3	2	--
WESTFORD	0	179	8	--	2	0	0
WESTHAMPTON	2	13	0	0	0	0	0
WESTMINSTER	0	65	9	--	1	0	--
WESTON	0	86	--	0	0	0	0
WESTPORT	2	110	10	5	2	1	0
WESTWOOD	0	144	9	0	0	0	0
WEYMOUTH	3,806	705	40	25	2	1	--
WHATELY	0	17	0	--	0	0	0
WHITMAN	0	219	19	9	0	0	--
WILBRAHAM	0	104	--	0	0	0	0
WILLIAMSBURG	1	30	--	0	1	0	0
WILLIAMSTOWN	3	29	--	--	0	0	0
WILMINGTON	0	256	13	6	0	0	0
WINCHENDON	0	106	10	17	1	0	0
WINCHESTER	2,045	237	10	--	0	0	--
WINDSOR	0	3	--	0	0	0	0
WINTHROP	0	179	14	9	1	0	0
WOBURN	1	538	38	13	1	1	--
WORCESTER	6,257	2,554	232	251	21	14	25
WORTHINGTON	0	4	0	0	0	0	0
WRENTHAM	0	113	8	--	1	1	0
YARMOUTH	1	238	20	15	1	0	--

"--" Due to small numbers (n=1-4), exact count not provided.

Note that infant deaths are based on a preliminary death file as of the release of this report.

1. Values of 1-4 for medical characteristics of communities with less than 200 births are suppressed based on Guidelines for Release of Birth Data, Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. 2. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 3. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 4. Less than 2,500 grams (5.5 lbs.). 5. Death of a child whose age is less than one year. 6. Death of a child whose age is less than 28 days. 7. A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more.

Table 34. Birth Characteristics: Occurrence and Resident Births and Infant Deaths by County, Massachusetts: 2007

County	Occurrence Births[1]	Resident Births[2]			Deaths		
		Number	Low Birthweight[3]	Teen Births (15-19 years)	Infant Deaths[4]	Neonatal Deaths[5]	Fetal Deaths[6]
STATE TOTAL	**78,724**	**77,934**	**6,147**	**4,944**	**380**	**263**	**399**
Barnstable	1,691	1,987	130	104	9	4	6
Berkshire	1,236	1,242	106	121	3	2	7
Bristol	4,757	6,395	505	536	41	32	23
Dukes	182	204	9	6	1	1	--
Essex	7,715	9,071	764	661	51	37	44
Franklin	549	707	47	57	1	0	--
Hampden	6,251	5,809	517	839	36	24	40
Hampshire	1,047	1,259	77	59	7	4	5
Middlesex	15,959	18,317	1,347	621	62	51	78
Nantucket	151	184	12	5	0	0	--
Norfolk	4,372	7,665	557	169	28	16	34
Plymouth	3,508	5,840	411	343	26	12	41
Suffolk	21,818	9,521	905	727	60	44	50
Worcester	9,488	9,733	760	696	55	36	63

"--" Due to small numbers (n=1-4), exact count not provided.

Note that infant deaths are based on a preliminary death file as of the release of this report.
1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more.

Table 35. Birth Characteristics, Occurrence and Resident Births and Infant Deaths, Massachusetts Community Health Network Areas (CHNAs), Massachusetts: 2007

Community Health Network Area	Occurrence Births[1]	Resident Births[2]			Deaths		
		Number	LBW[3]	Teen Births (15-19 years)	Infant[4]	Neonatal[5]	Fetal[6]
STATE TOTAL	**78,724**	**77,934**	**6,147**	**4,944**	**380**	**263**	**399**
Community Health Network of Berkshire County	1,236	1,242	106	121	3	2	7
Upper Valley Health Web (Franklin County)	550	876	61	74	2	0	--[7]
Partnership for Health in Hampshire County (Northampton)	1,045	1,241	75	58	7	4	5
The Community Health Connection (Springfield)	5,629	3,857	362	575	22	14	27
Community Health Network of Southern Worcester County	425	1,420	119	116	11	7	8
Community Partners for Health (Milford)	1,081	2,087	128	70	3	0	13
Community Health Network of Greater Metro West (Framingham)	1,946	4,716	321	115	17	16	26
Community Wellness Coalition (Worcester)	6,263	3,917	323	290	22	15	33
Fitchburg/Gardner Community Health Network	1,722	2,988	242	235	21	15	9
Greater Lowell Community Health Network	2,606	3,579	265	266	15	11	14
Greater Lawrence Community Health Network	3,088	2,734	253	279	15	12	16
Greater Haverhill Community Health Network	705	1,760	144	106	9	5	7
Community Health Network North (Beverly/Gloucester)	2,113	1,101	74	29	2	1	5
North Shore Community Health Network	1,809	3,476	293	247	25	19	16
Greater Woburn/Concord/Littleton Community Health Network	3,182	2,224	146	32	5	3	11
North Suburban Health Alliance (Medford/Malden/Melrose)	1,255	3,511	307	117	11	9	12
Greater Cambridge/Somerville Community Health Network	3,567	3,462	219	57	14	13	22
West Suburban Health Network (Newton/Waltham)	3,404	2,682	201	42	5	4	8
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	21,822	10,189	956	732	61	45	51
Blue Hills Community Health Alliance (Greater Quincy)	4,365	4,424	318	116	21	10	15
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	624	1,891	152	264	13	9	13
Greater Brockton Community Health Network	2,357	3,192	284	230	18	10	21
South Shore Community Partners in Prevention (Plymouth)	732	2,102	112	74	6	2	15
Greater Attleboro-Taunton Health & Education Response	1,521	3,006	201	148	7	6	13
Partners for a Healthier Community (Fall River)	1,661	1,625	128	183	20	17	8
Greater New Bedford Health & Human Services Coalition	1,992	2,257	206	253	15	9	9
Cape and Islands Community Health Network	2,024	2,375	151	115	10	5	9

Note that infant deaths are based on a preliminary death file as of the release of this report.

1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more. 7. When the number of fetal deaths is between 1-4, it is suppressed.

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Technical Notes

Data Availability

This publication and other Department of Public Health publications and materials can be accessed on the Internet at:

http://www.state.ma.us/dph/pubstats.htm

Detailed information on 2007 births in Massachusetts, as well as access to other Department of Public Health data, is available on the Department's free, Internet-accessible data warehouse, **MassCHIP**. To register as a user, visit the MassCHIP website at http://masschip.state.ma.us, or call 1-888-MASCHIP (within MA only) or 617-624-5629.

Data Cautions

Limitations of small numbers:
Cells in some tables in this publication, and particularly those tables specific to individual cities and towns, contain small numbers. Rates and proportions based on fewer than five observations are suppressed, and trends based upon small numbers should be interpreted cautiously.

Differences with previously published data
Numbers and rates in this publication may differ from those in previous reports because of updated birth and death files, or release of the most up-to-date population estimates for a given year (see Technical Note #4 for details on population files).

Self-reported data
Many statistics reported in this publication, such as maternal smoking, education, and race/ethnicity are *self-reported*, and are subject to the usual limitations of this type of information.

Changes in the Collection of Race and Ethnicity Information

Assignment of an Infant's Race/Ethnicity
Prior to 1989, the race/ethnicity of an infant was assigned by combining information on the race/ethnicity of the mother and the race/ethnicity of the father. Since 1989, Massachusetts has followed the recommendation of the National Center for Health Statistics of classifying births according to the self-reported race/ethnicity of the mother. Therefore, beginning in 1989, the race/ethnicity of an infant is identical to the self-reported race/ethnicity of the infant's mother.

Addition of Information on Hispanic Ethnicity
Beginning in 1986, an identifier for Hispanic ethnicity was added to the birth certificate; in 1989, an identifier for Hispanic ethnicity was added to the death certificate. Prior to these changes, most infants and mothers of Hispanic ethnicity were included with whites and it was not possible to accurately calculate Hispanic-specific rates of natality and mortality.

Changes in Mother's Ancestry Reporting

The following table is from the Parent Worksheet for the birth certificate, which is the self-reported information we use to report on mother's ancestry.

MOTHER's ANCESTRY Please mark the *one* category that *best describes* the mother's ancestry of ethnic heritage:

HISPANIC/LATINA

1 ☐ Puerto Rican
2 ☐ Dominican
3 ☐ Mexican
4 ☐ Cuban
5 ☐ Colombian
6 ☐ Salvadoran
7 ☐ Other Central American (specify) _____
8 ☐ Other South American (specify) _____
9 ☐ Other Hispanic/Latina (specify):

ASIAN/PACIFIC ISLANDER

10 ☐ Chinese
11 ☐ Vietnamese
12 ☐ Cambodian
13 ☐ Asian Indian
14 ☐ Korean
15 ☐ Filipino
16 ☐ Japanese
17 ☐ Laotian
18 ☐ Pakistani
19 ☐ Thai
20 ☐ Hawaiian
21 ☐ Other Asian/Pacific Islander(specify) _____

PORTUGUESE SPEAKING

22 ☐ Cape Verdean
23 ☐ Brazilian
24 ☐ Other Portuguese (specify): _____

WEST INDIAN/CARIBBEAN ISLANDER

25 ☐ Haitian
26 ☐ Jamaican
27 ☐ Barbadian
28 ☐ OtherWest Indian/Caribbean Islander (specify):_____

AFRICAN/AFRICAN AMERICAN

29 ☐ African-American/ Afro-American
30 ☐ Nigerian
31 ☐ Other African specify):_____

MIDDLE EASTERN

32 ☐ Lebanese
33 ☐ Iranian
34 ☐ Israeli
35 ☐ Other Middle Eastern (specify):_____

AMERICAN ANCESTRY

36 ☐ Native American/ American Indian (specify tribe/affiliation):_____
37 ☐ American

EUROPEAN and OTHER ancestries

38 ☐ European (specify): _____
39 ☐ Other (specify): _____

Beginning in 2006, we eliminated the "Other" categories from the mother's ancestries and used the literal ancestry text to create new categories such as "Honduran" and "Guatemalan", which a large number of mothers wrote in for "Other Hispanic/Latina". In 2006, we reported on groups that had greater than 400 births.

In 2007, certain ancestry groups were combined to form meta-groups: Lebanese, Iranian, Israeli, and Other Middle Eastern ancestries were combined into "Middle Eastern"; Colombian and Other South American were combined into "South American"; and Nigerian and Other African were combined into "African."

Population Denominators

In *Massachusetts Births 2007*, there are two sources for the population denominators used to calculate population-based rates. For state level birth rates e.g., birth rate, teen birth rate, teen birth rates by race and Hispanic ethnicity, age-specific birth rates, and the crude birth rate, we used the latest available population for 2007, the MARS (Modified Age, Race/Ethnicity, and Sex) file, which is produced by the National Center for Health Statistics (NCHS) and the Census Bureau Population Estimates Program. This file has data by single year or age, sex, race and Hispanic ethnicity in the five mutually exclusive categories used by the Department: White Non-Hispanic, Black Non-Hispanic, Asian Non-Hispanic, American Indian/Alaska Native Non-Hispanic, and Hispanic. These estimates are not available for geographic levels below the county. See the "Note to Readers" at the beginning of this report.

For city and town rates, we have used population estimates for 2005, which are the most up-to-date population estimates available by age, race, and sex at the sub-county level. If the population in your community increased from 2005 to 2007, the rates listed may **overestimate** the actual rate. If the population in your community declined from 2005 to 2007, the rates given in the publication may **underestimate** the actual rate. As soon as new population data are available, revised rates will be posted on MassCHIP, the Department's online database (http://masschip.state.ma.us).

Note on Population Estimate Changes Due to Readjustment for Boston and Medford:

In 2006, the cities of Boston and Medford challenged the Census Bureau's population estimates for their cities. Boston disagreed with the estimates that showed Boston had lost 30,000 in population since 2000. The Census Bureau accepted much of that challenge and increased the city's estimated population for 2005 from 559,034 to 596,638, an increase of 37,604 or 6.7%. The Census Bureau accepted Medford's challenge and increased its estimate for 2005 from 53,523 to 55,798, an increase of 2,275 or 4.3%. The combined population increase for the two cities was 39,879. One impact of these adjustments was an increase in the state's female teen population of 12,111. Since the Census Bureau's 2006 population estimates are based upon their (final) 2005 estimates, this means that the 2006 teen population is 13,540 larger than the original 2005 estimate. Refer to Table A for the statewide age, race, and sex population distribution.

Source for 2007 Population Estimates

National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000-July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the U.S. Census Bureau; released August 7, 2008. Available from:
http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm as of September 5, 2008.

Source for 2005 Population Estimates (used for city/town rates)

Massachusetts Department of Public Health, Bureau of Health Information, Statistics, Research, and Evaluation, Division of Research and Epidemiology. Massachusetts Department of Public Health Modified Age, Race/Ethnicity, and Sex (MMARS00-05) which is based upon 2005 estimates produced by the National Center for Health Statistics in collaboration with the Census Bureau's Population Estimation Program. October 2006. Available on the Internet from:
http://masschip.state.ma.us.

For additional information about population and MDPH estimation methods, refer to the Technical Notes in the report, *Massachusetts Births 2005,* which can be downloaded from the following website:
http://www.mass.gov/dph/pubstats.htm

Table 36. 2007 Massachusetts Population Estimates[1] by Age Group, Gender, Race and Hispanic Ethnicity[2] (mutually exclusive)

Age Group	Total	White Non-Hispanic	Black Non-Hispanic	Native American Non-Hispanic	Asian Non-Hispanic	Hispanic
Female						
0 to 4	184,336	130,552	16,497	454	11,907	24,926
5 to 9	188,649	138,879	15,877	464	10,918	22,511
10 to 14	198,123	149,006	15,473	524	10,238	22,882
15 to 19	224,406	170,593	18,064	656	11,020	24,073
20 to 24	227,906	172,517	17,422	774	14,108	23,085
25 to 29	207,846	150,818	15,822	554	16,707	23,945
30 to 34	202,960	147,382	14,412	469	17,682	23,015
35 to 39	235,610	181,813	15,379	522	15,885	22,011
40 to 44	258,842	209,149	15,786	564	13,350	19,993
45 to 49	264,769	222,115	14,774	679	10,846	16,355
50+	1,129,815	1,007,169	46,951	2,185	32,088	41,422
All Females	**3,323,262**	**2,679,993**	**206,457**	**7,845**	**164,749**	**264,218**
Male						
0 to 4	192,512	136,416	17,375	439	12,279	26,003
5 to 9	195,513	144,664	16,253	481	10,831	23,284
10 to 14	208,617	157,957	16,173	507	9,943	24,037
15 to 19	228,981	174,141	18,122	673	10,840	25,205
20 to 24	224,868	169,322	17,656	673	12,651	24,566
25 to 29	210,654	150,779	16,342	581	15,542	27,410
30 to 34	202,336	145,696	13,547	561	18,007	24,525
35 to 39	228,811	175,816	14,180	485	16,966	21,364
40 to 44	251,069	202,832	14,772	600	13,623	19,242
45 to 49	255,551	215,662	13,701	680	10,609	14,899
50+	927,581	827,105	36,577	1,975	28,818	33,106
All Males	**3,126,493**	**2,500,390**	**194,698**	**7,655**	**160,109**	**263,641**
Total						
0 to 4	376,848	266,968	33,872	893	24,186	51,489
5 to 9	384,162	283,543	32,130	945	21,749	46,355
10 to 14	406,740	306,963	31,646	1,031	20,181	47,479
15 to 19	453,387	344,734	36,186	1,329	21,860	49,838
20 to 24	452,774	341,839	35,078	1,447	26,759	48,211
25 to 29	418,500	301,597	32,164	1,135	32,249	51,915
30 to 34	405,296	293,078	27,959	1,030	35,689	48,100
35 to 39	464,421	357,629	29,559	1,007	32,851	43,935
40 to 44	509,911	411,981	30,558	1,164	26,973	39,795
45 to 49	520,320	437,777	28,475	1,359	21,455	31,814
50+	2,057,396	1,834,274	83,528	4,160	60,906	78,560
State Total	**6,449,755**	**5,180,383**	**401,155**	**15,500**	**324,858**	**537,491**

1. National Center for Health Statistics. Postcensal estimates of the resident population of the United States for July 1, 2000-July 1, 2007, by year, county, age, bridged race, Hispanic origin, and sex (Vintage 2007). Prepared under a collaborative arrangement with the U.S. Census Bureau; released August 7, 2008. Available from: http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm as of September 5, 2008. 2. Persons of Hispanic ethnicity are NOT included in the race categories. These estimates are used to calculate state-wide population based rates published in this report.

Change in Measurement of Adequacy of Prenatal Care

Change in Adequacy of Prenatal Care Indicator since *Massachusetts Births 2001*:
(This discussion is based on excerpts from "An Overview of the APNCU Index" by Milton Kotelchuck, Sept. 1994, available online at

http://www.mchlibrary.info/databases/HSNRCPDFs/Overview_APCUIndex.pdf. Accessed December 2003).

Beginning with *Massachusetts Births 2001*, adequacy of prenatal care is being measured using a new method. The Adequacy of Prenatal Care Utilization (APNCU) Index, developed by Dr. Milton Kotelchuck, has replaced the Kessner Index, which had been used in the *Advanced Data Births* and *Massachusetts Births* series. The APNCU Index is the standard used in Healthy People 2010 and by the majority of states. It improves upon the Kessner Index in various ways, the most important being the ability to distinguish between inadequate prenatal care due to the timing of initiation and inadequate care due to insufficient prenatal care visits. The APNCU Index also improves upon the Kessner Index by correcting some of its principal faults. First, the APNCU Index more accurately assesses adequacy of visits for term pregnancies; the Kessner Index characterizes 9 or more visits as adequate, due to an early computer database limitation, which only allowed for a single-digit number to record prenatal care visits. Other faults of the Kessner Index include its bias towards measurement of adequacy of initiation of care, and its various computational algorithms due to inadequate initial documentation.

Table 1 of this report provides a comparison of data on adequacy of prenatal care from 1996-2007 as measured by these two separate indices. Below are the definitions for the APNCU Index categories and its two component indices (initiation and received services), and the definition of the Kessner Index categories. Also below is a short summary of the major differences in classification of adequacy of prenatal care using the Kessner Index and the APNCU Index.

The APNCU Index characterizes prenatal care (PNC) utilization by measuring two distinct components of prenatal care -- adequacy of initiation and adequacy of received services (visits). Each of these components is measured as an independent index, and the APNCU Index is a summary of these 2 component indices. As with the Kessner Index, the APNCU Index does not assess quality of the prenatal care that is delivered, only its utilization.

Adequacy of Prenatal Care Utilization (APNCU) Index: Definition of Categories

Category	Month Prenatal Care Began	% of Expected[1] Prenatal Care Visits
Adequate Intensive	1, 2, 3, or 4	110% or more
Adequate Basic	1, 2, 3, or 4	80 – 109%
Intermediate	1, 2, 3, or 4	50 – 79%
Inadequate	Month 5 or later	Less than 50%
Unknown	Prenatal care information not recorded	

[1] The number of "expected" visits is determined based on standards set by the American College of Obstetricians and Gynecologists (ACOG).

Component Indices of the APNCU Index: Definitions of Categories

Component Indices and Summary Index:

The first component index is "Adequacy of Initiation," which describes the adequacy of when prenatal care began during pregnancy. The assumption underlying this scale is that the earlier PNC begins the better. The month or trimester prenatal care begins is widely used as a measure to assess the adequacy of timing of initiation of PNC, since it accurately and succinctly describes when PNC begins. The APNCU Index uses this measure to determine the "adequacy of initiation."

The second component index, "Adequacy of Received Services" (visits), characterizes the adequacy of received PNC visits during the time period after prenatal care is begun until the delivery. This component attempts to characterize if the woman received the appropriate number of prenatal care visits for the time period in which she received PNC services. [The appropriate number of visits is based on recommendations of the American College of Obstetricians and Gynecologists for an uncomplicated pregnancy. For example, a woman beginning prenatal care during the first month of pregnancy who delivers during the 40th week of gestation (and has no complications with her pregnancy) should receive 14 visits].

The two component indices are measured independently from one another, and can be used as separate indices, since the policy and practice issues underlying whether women are beginning care early and whether they are receiving the recommended amount of visits may be quite distinct. However, because of the popularity and utility of using one overall adequacy of PNC index, the two component indices are combined into a single summary index – the "Adequacy of Prenatal Care Utilization (APNCU) Index."

Index Categories

Both component indices and the summary index (APNCU Index) characterize PNC as one of five categories: "adequate intensive," "adequate basic," "intermediate," "inadequate," or "unknown." The category "adequate basic" refers to the minimum recommended level of care (for a pregnancy with no complications), while "adequate intensive" refers to a level of care exceeding recommended standards. The sum of the "adequate basic" and "adequate intensive" categories is the total adequacy score. In addition, the "inadequate" category can be subdivided to isolate those women who received no PNC. [For definitions of categories, please see the Technical Notes in the Appendix.]

[For more detail on the methodology of the APNCU Index, please call the Bureau of Health Information, Statistics, Research & Evaluation at 617-624-5600].

Adequacy of Initiation Index

Category	Month Prenatal Care Began
Adequate Intensive	1 or 2
Adequate Basic	3 or 4
Intermediate	5 or 6
Inadequate	Month 7 or later, or no PNC
Unknown	Prenatal care initiation information not recorded

Adequacy of Received Services (Visits) Index

Category	% of Expected Prenatal Care Visits
Adequate Intensive	110% or more
Adequate Basic	80 – 109%
Intermediate	50 – 79%
Inadequate	Less than 50%
Unknown	Information on prenatal care visits not recorded

Kessner Index of Adequacy of Prenatal Care: Definition of Categories

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
Inadequate	1	1-4
	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	Unknown	Unknown

Summary of Major Differences in Categorization of Adequacy of Prenatal Care between the Kessner Index and the APNCU Index

The two different methods used in the Kessner Index and APNCU Index to calculate adequacy of prenatal care can result in differences in how each one classifies adequacy of prenatal care. These differences only occur under certain conditions, not in all cases (see "Explanation" column).

The Kessner Index classifies prenatal care as…	… but the APNCU Index classifies prenatal care as …	Explanation
Intermediate	Adequate Basic	This is primarily due to the fact that the APNCU Index allows for prenatal care in the 4th month of pregnancy to be considered adequate if the mother received 80-109% of expected visits, whereas the Kessner Index only allows for care begun in the first trimester (months 1-3) to be considered adequate.
Intermediate	Inadequate	This is primarily due to the fact that the APNCU requires that the mother must make at least 50% of the "expected visits for a normal pregnancy", i.e., 7 visits, which is 50% of the recommended 14 visits for a normal pregnancy, to be "intermediate", while the Kessner Index allows 5 or 6 visits to meet "intermediate" status if the initiation of PNC is in the second trimester.
Adequate	Intermediate	This is primarily due to the consideration of "expected" visits (based on when the mother initiated care and the length of gestation) using the APNCU Index, which bases expected visits on the ACOG recommendations, which can be as high as 14 visits if a gestational period is 40 weeks, whereas the Kessner Index considers 9 visits sufficient in all cases.
Adequate	Adequate Intensive	The APNCU Index added an "Adequate Intensive" category, which is not used in the Kessner Index. This allows analysis of situations in which more than normal care is received (e.g. women with high risk conditions, pregnancy complications).

Tests of Statistical Significance

Since the 2005 report, statistics presented in the text section have been tested to determine whether they differ significantly from a target statistic. For example, the number of births in 2007 was compared with the number of births in 2006, to determine whether their difference could have occurred by chance. When a difference is unlikely to have occurred by chance, it is referred to as "significant."

Note that with respect to statistical difference, the language in the reports beginning with 2005 differs from that of past reports, and caution must be used when comparing the text of previous reports with this year's report.

In testing for statistical significance, we have used the testing methods from the National Center for Health Statistics (NCHS). These methods are presented in the following document:

> National Vital Statistics Reports, Volume 52, Number 10
> Births: Final Data for 2002
> by Joyce A. Martin, M.P.H.; Brady E. Hamilton, Ph.D.; Paul D. Sutton, Ph.D.; Stephanie J. Ventura, M.A.; Fay Menacker, Dr. P.H.; and Martha L. Munson, M.S.;
> From the Division of Vital Statistics, NCHS.
> Technical Notes, "Significance testing" section beginning on page 110.

This document is available from the following website:
http://www.cdc.gov/nchs/products/pubs/pubd/nvsr/52/52-23.htm

For comparisons of more than 100 events, whether they are rates, proportions, or numbers, the binomial distribution is assumed, and confidence intervals are examined to see whether they overlap (Refer to the "Confidence Intervals and Infant Mortality Rates" section in this Appendix for an explanation of using confidence intervals to determine statistical significance.) When the number of events is less than 100, a Poisson distribution is assumed, and confidence intervals are constructed based upon the Poisson distribution. For more details and exact formulas for calculating confidence intervals or other tests of statistical significance, refer to the publication listed above.

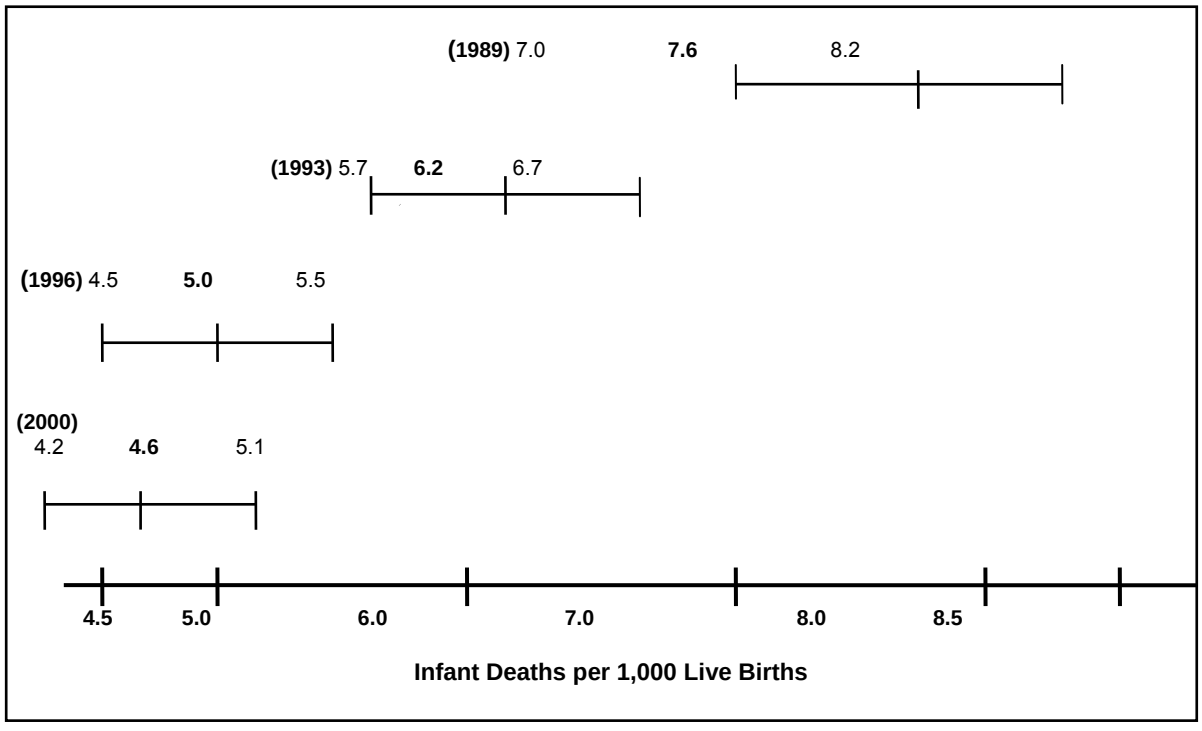
When two statistics are determined to differ significantly, they then are referred to in the text with language expressing differences, such as "higher" and "lower", or "increased" and "decreased". Otherwise, differences which are not significant are reported as having "no change" or "no statistical difference."

Confidence Intervals and Infant Mortality Rates

Beginning with the 1992 Advance Data: Births publication, 95% confidence intervals were added to the calculation of infant mortality rates (IMRs). The confidence interval (CI) provides a measure of stability of the IMR and a basis for comparing rates to determine if they are statistically different. Rates can be compared for the same group in different years or for different groups in the same year. The width of the CI reflects the stability of the IMR. For example, a narrow CI reflects high stability, and a wide interval reflects low stability. If the CIs around two IMRs being compared do not overlap, the difference between the two rates is statistically significant. The following table and chart illustrate the concept of statistically significant differences using actual data from 1989, 1993, 1996, and 2000.

Comparison of Infant Mortality Rates and Confidence Intervals for Selected Years

Year	IMR (per 1,000 births)	95% Confidence Interval
1989	7.6	(7.0-8.2)
1993	6.2	(5.7-6.7)
1996	5.0	(4.5-5.5)
2000	4.6	(4.2-5.1)



The difference between the 1993 IMR and 1996 IMR is statistically significant – the confidence intervals do not overlap. The same is true for the differences between the 1989 IMR and each annual IMR for 1993, 1996, and 2000. However, the difference between the 1996 and 2000 IMRs is not statistically significant, since their confidence intervals overlap.

Table 37. 95% Confidence Intervals for Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 1990-2007

	Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian	
Year	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)	n	Rate[2] (95% CI)
1990	649	7.0 (6.5, 7.5)	442	6.1 (5.5, 6.7)	98	13.7 (11.0, 16.4)	77	9.1 (7.1, 11.1)	24	7.0 (4.2, 10.0)
1991	577	6.5 (6.0, 7.0)	381	5.5 (4.9, 6.1)	101	15.0 (12.1, 17.9)	80	9.4 (7.3, 11.5)	14	4.2 (2.0, 6.4)
1992	569	6.5 (6.0, 7.0)	371	5.5 (4.9, 6.1)	110	16.4 (13.4, 19.4)	67	7.9 (6.0, 9.8)	16	4.9 (2.5, 7.3)
1993	523	6.2 (5.7, 6.7)	346	5.3 (4.7, 5.9)	84	13.1 (10.3, 15.9)	77	9.3 (7.2, 11.4)	13	3.9 (1.8, 6.0)
1994	499	6.0 (5.4, 6.5)	343	5.3 (4.7, 5.9)	79	12.6 (9.8, 15.4)	64	7.6 (5.7, 9.4)	8	2.4 (0.7, 4.0)
1995	419	5.1 (4.6, 5.6)	275	4.4 (3.8, 4.9)	65	11.1 (8.4, 13.8)	58	7.2 (5.3, 9.0)	19	5.5 (3.0, 8.0)
1996	403	5.0 (4.5, 5.5)	289	4.7 (4.1, 5.2)	63	11.4 (8.6, 14.2)	40	5.1 (3.5, 6.7)	8	2.2 (0.7, 3.7)
1997	425	5.3 (4.8, 5.8)	294	4.8 (4.2, 5.3)	64	11.7 (8.8, 14.5)	55	6.7 (4.9, 8.4)	10	2.6 (1.0, 4.2)
1998	414	5.1 (4.6, 5.6)	294	4.6 (4.1, 5.2)	64	10.6 (7.9, 13.3)	55	6.7 (5.0, 8.4)	10	2.7 (1.0, 4.3)
1999	418	5.2 (4.7, 5.7)	285	4.7 (4.2, 5.3)	72	12.3 (9.5, 15.1)	49	5.5 (4.0, 7.1)	8	1.9 (0.6, 3.3)
2000	377	4.6 (4.2, 5.1)	232	3.8 (3.4, 4.3)	74	12.8 (9.9, 15.7)	48	5.2 (3.7, 6.6)	19	4.1 (2.2, 5.9)
2001	407	5.0 (4.5, 5.5)	245	4.1 (3.6, 4.7)	71	12.1 (9.3, 14.9)	69	7.3 (5.6, 9.1)	15	3.1 (1.6, 4.7)
2002	397	4.9 (4.4, 5.4)	239	4.1 (3.6, 4.6)	69	11.6 (8.9, 14.3)	67	7.0 (5.3, 8.7)	16	3.0 (1.5, 4.5)
2003	383	4.8 (4.3, 5.3)	235	4.1 (3.6, 4.6)	75	12.7 (9.8, 15.5)	55	5.6 (4.1, 7.1)	14	2.7 (1.3, 4.1)
2004	376	4.7 (4.3, 5.3)	210	3.8 (3.3, 4.3)	70	11.5 (8.9, 14.2)	75	7.6 (5.9, 9.4)	15	2.7 (1.4, 4.1)
2005	391	5.1 (4.6, 5.6)	230	4.3 (3.7, 4.9)	57	9.4 (7.0, 11.8)	78	7.8 (6.0, 9.5)	18	3.4 (1.8, 5.0)
2006	369	4.8 (4.3, 5.2)	221	4.2 (3.6, 4.7)	72	11.1 (8.6, 13.7)	62	5.8 (4.4, 7.2)	10	1.8 (0.7, 3.0)
2007	380	4.9 (4.4, 5.4)	206	3.9 (3.4, 4.4)	66	10.2 (7.8, 12.6)	81	7.4 (5.8, 9.1)	18	3.1 (1.7, 4.6)

1. Deaths of infants of unknown race are excluded except for the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Rates are expressed per 1,000 live births.

In 2007, the black infant mortality rate was 10.2 deaths per 1,000 live births (95% CI: 7.8, 12.6), which was more than two times greater than the white infant mortality rate of 3.9 (95% CI: 3.4, 4.4). The difference in these two rates was statistically significant. The rate of infant mortality for blacks was also significantly elevated compared with Asians (95% CI: 1.7, 4.6) in 2007.

Definition of Rates and Ratios

Age-Specific Birth Rate

The number of children born to women in a specific age group divided by the population of women in that specific age group, multiplied by 1,000.

$$\text{Age-Specific Birth Rate} = \frac{\text{Number of births to females ages X to Y years}}{\text{Number of females ages X to Y years in the population}} \times 1{,}000$$

Birth Rate

(See Age-Specific Birth Rate, Crude Birth Rate, Fertility Rate, and Teen Birth Rate)

Cesarean Section Rates

$$\text{Total C-section Rate} = \frac{\text{Number of C-section births}}{\text{Number of occurrence births}} \times 100$$

$$\text{Primary C-section Rate} = \frac{\text{Number of primary C-section births}}{\text{[Number of occurrence births-(number of repeat C-section births+VBACs)]}} \times 100$$

$$\text{Repeat C-section Rate} = \frac{\text{Number of repeat C-section births}}{\text{(Number of repeat C-section births+number of VBACs)}} \times 100$$

$$\text{VBAC Rate} = \frac{\text{Number of VBACs}}{\text{(Number of repeat C-section births+number of VBACs)}} \times 100$$

Crude Birth Rate

$$\text{Crude Birth Rate} = \frac{\text{Number of resident live births}}{\text{Total resident population}} \times 1{,}000$$

Fertility Rate (sometimes referred to as "Birth Rate")

$$\text{Fertility Rate} = \frac{\text{Number of births to females ages 15-44 years}}{\text{Number of females ages 15-44 years in the population}} \times 1{,}000$$

Fetal Mortality Rate

$$\text{Fetal Mortality Rate} = \frac{\text{Number of fetal deaths}}{\text{Number of fetal deaths plus live births in the same year}} \times 1{,}000$$

Feto-Infant Mortality Rate

$$\text{Feto-Infant Mortality Rate} = \frac{\text{Number of fetal deaths + Number of infant deaths}}{\text{Number of fetal deaths + live births in the same year}} \times 1{,}000$$

(Refer to the definitions of Fetal Mortality Rate and Infant Mortality Rate for more details.)

Infant Mortality Rate (IMR)
The death rate among infants less than one year old per 1,000 live births.

$$\text{Infant Mortality Rate} = \frac{\text{Number of resident deaths of infants less than one year old in a year}}{\text{Number of resident live births in the same year}} \times 1{,}000$$

Inter-pregnancy Interval (IPI)
Inter-pregnancy interval is the time, in months, between the date of last menstrual period of current pregnancy and the date of previous live birth. IPI is calculated for each mother currently giving birth to their second or later child.

$$\text{\%Short IPI} = \frac{\text{Number of mothers giving birth to their 2nd or later child with IPI <12 months}}{\text{Number of mothers giving birth to their 2nd or later child in the same year}} \times 100$$

$$\text{\% IPI 12 to 35 months} = \frac{\text{Number of mothers giving birth to their 2nd or later child with IPI between 12 and 35 months}}{\text{Number of mothers giving birth to their 2nd or later child in the same year}} \times 100$$

$$\text{\% IPI 36+ months} = \frac{\text{Number of mothers giving birth to their 2nd or later child with IPI >=36 months}}{\text{Number of mothers giving birth to their 2nd or later child in the same year}} \times 100$$

Maternal Mortality Ratio (MMR)
The number of maternal deaths per 100,000 live occurrence births. The term "ratio" is used instead of "rate" in this report because the numerator (number of deaths) is not a subset of the denominator (live births). The ideal measure would incorporate the total number of pregnancies not just live births in the denominator. However, pregnancies that result in late fetal death or end in induced terminations are difficult to record, and data are often incomplete. As a result, the population at risk of maternal death is generally taken as the number of live births, which is assumed to be a good proxy for the number of pregnancies.

$$\text{Maternal Mortality Ratio (MMR)} = \frac{\text{Number of maternal deaths}}{\text{Number of occurrence live births in the same year}} \times 100{,}000$$

Neonatal Mortality Rate (NMR)

The death rate among infants less than 28 days of age per 1,000 live births.

$$\text{Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants less than 28 days of age in a year}}{\text{Number of resident live births in the same year}} \times 1{,}000$$

Perinatal Mortality Rate

$$\text{Perinatal Mortality Rate} = \frac{\text{Number of fetal deaths from 28 weeks gestation plus infant deaths (less than 7 days old)}}{\text{Number of fetal deaths plus live births in the same year}} \times 1{,}000$$

Post Neonatal Mortality Rate

The death rate among infants 28 days of age to less than one year old per 1,000 live births.

$$\text{Post Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants 28 days of age to less than one year of age in a year}}{\text{Number of resident live births in the same year}} \times 1{,}000$$

Pregnancy-Associated Mortality Ratio (PAMR)

The number of pregnancy-associated deaths per 100,000 live occurrence births. The term "ratio" is used instead of rate in this report because the numerator includes some maternal deaths that were not related to live-born infants and thus were not included in the denominator.

$$\text{Pregnancy-Associated Mortality Ratio (PAMR)} = \frac{\text{Number of pregnancy-associated deaths}}{\text{Number of occurrence live births in the same year}} \times 100{,}000$$

Teen Birth Rate

$$\text{Teen birth rate} = \frac{\text{Number of births to females ages 15-19 years old}}{\text{Number of females ages 15-19 years old in the population}} \times 1{,}000$$

Total Rate of Change

Total rate of change between two numbers or rates is expressed as a percentage in this report (e.g. The Massachusetts birth rate decreased by 12% from 1990 to 1996.):

$$\frac{Pn-Po}{Po} \times 100$$

where, Pn = rate during later time period
Po = rate during earlier time period

Table A1. Population Estimates[1] for Massachusetts Communities: 2005

TOWN NAME	COUNTY	CHNA	POPULATION
Abington	Plymouth	22	16,305
Acton	Middlesex	15	20,539
Acushnet	Bristol	26	10,535
Adams	Berkshire	1	8,456
Agawam	Hampden	4	28,547
Alford	Berkshire	1	400
Amesbury	Essex	12	16,617
Amherst	Hampshire	3	34,721
Andover	Essex	11	32,838
Aquinnah (Gay Head)	Dukes	27	362
Arlington	Middlesex	17	41,273
Ashburnham	Worcester	9	5,970
Ashby	Middlesex	9	2,926
Ashfield	Franklin	2	1,824
Ashland	Middlesex	7	15,431
Athol	Worcester	2	11,690
Attleboro	Bristol	24	43,364
Auburn	Worcester	8	16,393
Avon	Norfolk	22	4,345
Ayer	Middlesex	9	7,212
Barnstable	Barnstable	27	47,902
Barre	Worcester	9	5,375
Becket	Berkshire	1	1,783
Bedford	Middlesex	15	12,486
Belchertown	Hampshire	3	13,897
Bellingham	Norfolk	6	15,735
Belmont	Middlesex	17	23,453
Berkley	Bristol	24	6,352
Berlin	Worcester	9	2,683
Bernardston	Franklin	2	2,237
Beverly	Essex	13	39,833
Billerica	Middlesex	10	39,812
Blackstone	Worcester	6	9,051
Blandford	Hampden	4	1,266
Bolton	Worcester	9	4,428
Boston	Suffolk	19	558,435
Bourne	Barnstable	27	19,355
Boxborough	Middlesex	15	5,032
Boxford	Essex	12	8,162
Boylston	Worcester	8	4,253
Braintree	Norfolk	20	33,658
Brewster	Barnstable	27	10,242
Bridgewater	Plymouth	22	25,769
Brimfield	Hampden	5	3,627
Brockton	Plymouth	22	100,366
Brookfield	Worcester	5	3,096
Brookline	Norfolk	19	56,422
Buckland	Franklin	2	1,995
Burlington	Middlesex	15	23,265
Cambridge	Middlesex	17	101,529
Canton	Norfolk	20	21,481
Carlisle	Middlesex	15	4,823
Carver	Plymouth	23	11,552
Charlemont	Franklin	2	1,387
Charlton	Worcester	5	12,447
Chatham	Barnstable	27	6,833
Chelmsford	Middlesex	10	33,728
Chelsea	Suffolk	19	34,128
Cheshire	Berkshire	1	3,356
Chester	Hampden	21	1,320
Chesterfield	Hampshire	3	1,271
Chicopee	Hampden	21	54,599
Chilmark	Dukes	27	944
Clarksburg	Berkshire	1	1,663
Clinton	Worcester	9	13,997
Cohasset	Norfolk	20	7,219
Colrain	Franklin	2	1,858
Concord	Middlesex	15	16,858
Conway	Franklin	2	1,902
Cummington	Hampshire	3	986
Dalton	Berkshire	1	6,697
Danvers	Essex	14	25,999
Dartmouth	Bristol	26	31,371
Dedham	Norfolk	18	23,681
Deerfield	Franklin	2	4,786
Dennis	Barnstable	27	15,914
Dighton	Bristol	24	6,648
Douglas	Worcester	6	7,861
Dover	Norfolk	18	5,634
Dracut	Middlesex	10	28,805
Dudley	Worcester	5	10,787
Dunstable	Middlesex	10	3,142
Duxbury	Plymouth	23	14,655
East Bridgewater	Plymouth	22	13,832
East Brookfield	Worcester	5	2,111
East Longmeadow	Hampden	4	14,845
Eastham	Barnstable	27	5,550
Easthampton	Hampshire	3	15,994
Easton	Bristol	22	22,995
Edgartown	Dukes	27	3,934
Egremont	Berkshire	1	1,355
Erving	Franklin	2	1,542
Essex	Essex	13	3,342
Everett	Middlesex	16	37,100
Fairhaven	Bristol	26	16,223
Fall River	Bristol	25	92,117
Falmouth	Barnstable	27	33,620
Fitchburg	Worcester	9	40,514
Florida	Berkshire	1	666
Foxborough	Norfolk	7	16,288
Framingham	Middlesex	7	65,651
Franklin	Norfolk	6	30,748
Freetown	Bristol	26	8,963
Gardner	Worcester	9	20,955
Georgetown	Essex	12	8,023
Gill	Franklin	2	1,392
Gloucester	Essex	13	30,671
Goshen	Hampshire	3	956
Gosnold	Dukes	27	86
Grafton	Worcester	8	16,783
Granby	Hampshire	3	6,332
Granville	Hampden	4	1,644
Great Barrington	Berkshire	1	7,440
Greenfield	Franklin	2	17,888
Groton	Middlesex	9	10,396
Groveland	Essex	12	6,591
Hadley	Hampshire	3	4,820
Halifax	Plymouth	23	7,805
Hamilton	Essex	13	8,334
Hampden	Hampden	4	5,312
Hancock	Berkshire	1	1,018
Hanover	Plymouth	23	14,077
Hanson	Plymouth	23	9,915
Hardwick	Worcester	9	2,655
Harvard	Worcester	9	6,116
Harwich	Barnstable	27	12,673
Hatfield	Hampshire	3	3,280
Haverhill	Essex	12	60,032
Hawley	Franklin	2	345
Heath	Franklin	2	805
Hingham	Plymouth	20	21,470
Hinsdale	Berkshire	1	1,811
Holbrook	Norfolk	22	10,765
Holden	Worcester	8	16,571

Table A1 (cont'd). Population Estimates[1] for Massachusetts Communities: 2005

TOWN NAME	COUNTY	CHNA	POPULATION
Holland	Hampden	5	2,529
Holliston	Middlesex	7	13,830
Holyoke	Hampden	21	41,089
Hopedale	Worcester	6	6,234
Hopkinton	Middlesex	7	14,048
Hubbardston	Worcester	9	4,340
Hudson	Middlesex	7	18,847
Hull	Plymouth	20	11,279
Huntington	Hampshire	21	2,180
Ipswich	Essex	13	13,285
Kingston	Plymouth	23	12,435
Lakeville	Plymouth	24	10,618
Lancaster	Worcester	9	7,069
Lanesborough	Berkshire	1	2,951
Lawrence	Essex	11	81,591
Lee	Berkshire	1	5,882
Leicester	Worcester	8	10,953
Lenox	Berkshire	1	5,149
Leominster	Worcester	9	42,120
Leverett	Franklin	2	1,769
Lexington	Middlesex	15	30,452
Leyden	Franklin	2	815
Lincoln	Middlesex	15	7,935
Littleton	Middlesex	15	8,561
Longmeadow	Hampden	4	15,556
Lowell	Middlesex	10	105,749
Ludlow	Hampden	21	21,835
Lunenburg	Worcester	9	10,008
Lynn	Essex	14	92,186
Lynnfield	Essex	14	11,540
Malden	Middlesex	16	56,730
Manchester	Essex	13	5,332
Mansfield	Bristol	24	22,933
Marblehead	Essex	14	20,285
Marion	Plymouth	26	5,316
Marlborough	Middlesex	7	37,163
Marshfield	Plymouth	23	24,879
Mashpee	Barnstable	27	14,159
Mattapoisett	Plymouth	26	6,477
Maynard	Middlesex	7	10,221
Medfield	Norfolk	7	12,328
Medford	Middlesex	16	53,801
Medway	Norfolk	6	12,780
Melrose	Middlesex	16	26,366
Mendon	Worcester	6	5,743
Merrimac	Essex	12	6,350
Methuen	Essex	11	44,532
Middleborough	Plymouth	24	21,153
Middlefield	Hampshire	3	549
Middleton	Essex	11	9,077
Milford	Worcester	6	27,523
Millbury	Worcester	8	13,443
Millis	Norfolk	7	7,949
Millville	Worcester	6	2,938
Milton	Norfolk	20	26,243
Monroe	Franklin	2	100
Monson	Hampden	4	8,744
Montague	Franklin	2	8,416
Monterey	Berkshire	1	959
Montgomery	Hampden	4	743
Mt. Washington	Berkshire	1	135
Nahant	Essex	14	3,591
Nantucket	Nantucket	27	10,095
Natick	Middlesex	7	31,895
Needham	Norfolk	18	28,445
New Ashford	Berkshire	1	247
New Bedford	Bristol	26	94,502
New Braintree	Worcester	9	1,090
New Marlborough	Berkshire	1	1,522
New Salem	Franklin	2	986
Newbury	Essex	12	6,990
Newburyport	Essex	12	17,395
Newton	Middlesex	18	83,346
Norfolk	Norfolk	7	10,506
North Adams	Berkshire	1	14,031
North Andover	Essex	11	27,137
North Attleboro	Bristol	24	28,078
North Brookfield	Worcester	5	4,812
North Reading	Middlesex	16	13,930
Northampton	Hampshire	3	28,803
Northborough	Worcester	7	14,652
Northbridge	Worcester	6	14,184
Northfield	Franklin	2	3,226
Norton	Bristol	24	19,106
Norwell	Plymouth	20	10,382
Norwood	Norfolk	20	28,472
Oak Bluffs	Dukes	27	3,794
Oakham	Worcester	9	1,892
Orange	Franklin	2	7,659
Orleans	Barnstable	27	6,459
Otis	Berkshire	1	1,391
Oxford	Worcester	5	13,710
Palmer	Hampden	4	12,895
Paxton	Worcester	8	4,556
Peabody	Essex	14	50,954
Pelham	Hampshire	3	1,415
Pembroke	Plymouth	23	18,069
Pepperell	Middlesex	9	11,386
Peru	Berkshire	1	836
Petersham	Worcester	2	1,282
Phillipston	Worcester	2	1,753
Pittsfield	Berkshire	1	43,949
Plainfield	Hampshire	3	600
Plainville	Norfolk	7	7,994
Plymouth	Plymouth	23	54,781
Plympton	Plymouth	23	2,777
Princeton	Worcester	9	3,520
Provincetown	Barnstable	27	3,444
Quincy	Norfolk	20	90,458
Randolph	Norfolk	20	32,552
Raynham	Bristol	24	13,428
Reading	Middlesex	16	23,161
Rehoboth	Bristol	24	11,229
Revere	Suffolk	19	45,551
Richmond	Berkshire	1	1,618
Rochester	Plymouth	26	5,295
Rockland	Plymouth	23	17,842
Rockport	Essex	13	7,761
Rowe	Franklin	2	350
Rowley	Essex	12	5,832
Royalston	Worcester	2	1,366
Russell	Hampden	4	1,723
Rutland	Worcester	9	7,406
Salem	Essex	14	41,647
Salisbury	Essex	12	8,264
Sandisfield	Berkshire	1	830
Sandwich	Barnstable	27	20,707
Saugus	Essex	14	26,867
Savoy	Berkshire	1	724
Scituate	Plymouth	20	18,119
Seekonk	Bristol	24	13,660
Sharon	Norfolk	20	17,269
Sheffield	Berkshire	1	3,360
Shelburne	Franklin	2	2,054
Sherborn	Middlesex	7	4,220
Shirley	Middlesex	9	7,361

Table A1 (cont'd). Population Estimates[1] for Massachusetts Communities: 2005

TOWN NAME	COUNTY	CHNA	POPULATION
Shrewsbury	Worcester	8	33,171
Shutesbury	Franklin	2	1,843
Somerset	Bristol	25	18,564
Somerville	Middlesex	17	75,372
South Hadley	Hampshire	3	17,071
Southampton	Hampshire	3	5,828
Southborough	Worcester	7	9,511
Southbridge	Worcester	5	17,503
Southwick	Hampden	4	9,512
Spencer	Worcester	5	12,087
Springfield	Hampden	4	156,358
Sterling	Worcester	9	7,761
Stockbridge	Berkshire	1	2,256
Stoneham	Middlesex	16	21,594
Stoughton	Norfolk	22	26,782
Stow	Middlesex	7	6,159
Sturbridge	Worcester	5	8,825
Sudbury	Middlesex	7	17,035
Sunderland	Franklin	2	3,853
Sutton	Worcester	6	8,974
Swampscott	Essex	14	14,283
Swansea	Bristol	25	16,243
Taunton	Bristol	24	56,348
Templeton	Worcester	9	7,474
Tewksbury	Middlesex	10	28,990
Tisbury	Dukes	27	3,819
Tolland	Hampden	4	446
Topsfield	Essex	13	6,178
Townsend	Middlesex	9	9,273
Truro	Barnstable	27	2,162
Tyngsborough	Middlesex	10	11,297
Tyringham	Berkshire	1	352
Upton	Worcester	6	6,374
Uxbridge	Worcester	6	12,377
Wakefield	Middlesex	16	24,553
Wales	Hampden	5	1,818
Walpole	Norfolk	7	23,067
Waltham	Middlesex	18	59,564
Ware	Hampshire	3	9,988
Wareham	Plymouth	26	21,274
Warren	Worcester	5	5,040
Warwick	Franklin	2	763
Washington	Berkshire	1	546
Watertown	Middlesex	17	32,255
Wayland	Middlesex	7	13,015
Webster	Worcester	5	16,853
Wellesley	Norfolk	18	26,975
Wellfleet	Barnstable	27	2,821
Wendell	Franklin	2	1,035
Wenham	Essex	13	4,643
West Boylston	Worcester	8	7,708
West Bridgewater	Plymouth	22	6,819
West Brookfield	Worcester	5	3,896
West Newbury	Essex	12	4,301
West Springfield	Hampden	4	27,938
West Stockbridge	Berkshire	1	1,450
West Tisbury	Dukes	27	2,666
Westborough	Worcester	7	18,781
Westfield	Hampden	21	40,432
Westford	Middlesex	10	21,369
Westhampton	Hampshire	3	1,566
Westminster	Worcester	9	7,358
Weston	Middlesex	18	11,591
Westport	Bristol	25	15,053
Westwood	Norfolk	18	13,902
Weymouth	Norfolk	20	53,708
Whately	Franklin	2	1,584
Whitman	Plymouth	22	14,424
Wilbraham	Hampden	4	13,960
Williamsburg	Hampshire	3	2,433
Williamstown	Berkshire	1	8,276
Wilmington	Middlesex	15	21,431
Winchendon	Worcester	9	10,085
Winchester	Middlesex	15	21,139
Windsor	Berkshire	1	858
Winthrop	Suffolk	19	17,067
Woburn	Middlesex	15	37,074
Worcester	Worcester	8	179,839
Worthington	Hampshire	3	1,291
Wrentham	Norfolk	7	11,066
Yarmouth	Barnstable	27	24,663

1. Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006.

Table A2. Population Estimates[1] for Massachusetts Community Health Network Areas (CHNAs) and Counties: 2005

CHNA	POPULATION	COUNTY	POPULATION
1. Community Health Network of Berkshire County	131,965	Barnstable	226,505
2. Upper Valley Health Web (Franklin County)	88,506	Berkshire	131,965
3. Partnership for Health in Hampshire County (Northampton)	151,801	Bristol	547,711
4. The Community Health Connection (Springfield)	299,490	Dukes	15,605
5. Community Health Network of Southern Worcester County	119,141	Essex	750,463
6. Community Partners for Health (Milford)	160,521	Franklin	72,415
7. Community Health Network of Greater Metro West (Framingham)	379,658	Hampden	466,739
8 .Community Wellness Coalition (Worcester)	303,669	Hampshire	153,981
9. Fitchburg/Gardner Community Health Network	261,369	Middlesex	1,464,179
10. Greater Lowell Community Health Network	272,893	Nantucket	10,095
11. Greater Lawrence Community Health Network	195,176	Norfolk	656,472
12. Greater Haverhill Community Health Network	148,557	Plymouth	497,687
13. Community Health Network North (Beverly/Gloucester)	119,378	Suffolk	655,181
14. North Shore Community Health Network	287,352	Worcester	787,943
15. Greater Woburn/Concord/Littleton Community Health Network	209,597		
16. North Suburban Health Alliance (Medford/Malden/Melrose)	257,235	**STATE**	**6,436,940**
17. Greater Cambridge/Somerville Community Health Network	273,883		
18. West Suburban Health Network (Newton/Waltham)	253,138		
19. Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	711,603		
20. Blue Hills Community Health Alliance (Greater Quincy)	372,309		
21. Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	161,454		
22. Greater Brockton Community Health Network	242,404		
23. South Shore Community Partners in Prevention (Plymouth)	188,787		
24. Greater Attleboro-Taunton Health & Education Response	252,919		
25. Partners for a Healthier Community (Fall River)	141,977		
26. Greater New Bedford Health & Human Services Coalition	199,955		
27. Cape and Islands Community Health Network	252,204		

1. Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006.

Glossary

Adequacy of Prenatal Care Utilization (APNCU) Index
The Adequacy of Prenatal Care Utilization Index, developed by Dr. Milton Kotelchuck, is the measure used in this publication to classify the adequacy of prenatal care received by Massachusetts resident mothers. (*Please note:* Prior to the *Births 2001 publication, the Kessner Index was used to measure adequacy of prenatal care; please see definition for Kessner Index below*.) The APNCU Index has five categories (adequate intensive, adequate basic, intermediate, inadequate, and unknown), based on the month of pregnancy in which prenatal care begins and the percent of expected prenatal care visits for the time period during which a woman receives prenatal care services. Please see Technical Notes for more details.

Birthweight
The weight of an infant recorded at the time of delivery. It may be recorded in either pounds/ounces or grams. If recorded in pounds/ounces, it is converted to grams for use in this report.

1 pound = 453.6 grams
1,000 grams = 2 pounds and 3 ounces

Birthweight Categories

Normal birthweight (NBW):	An infant's weight of 2,500 grams (approximately 5.5 pounds) or more recorded at birth.
Low birthweight (LBW):	An infant's weight of less than 2,500 grams (5.5 pounds) recorded at birth.
Very low birthweight (VLBW):	An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

Cesarean Section or C-Section
Primary: A mother's first cesarean delivery.
Repeat: A Cesarean delivery that has been preceded by at least one Cesarean delivery.

Community Health Network Areas (CHNAs)
The Department of Public Health, in collaboration with health service providers, coalition members, and interested citizens, has designated 27 areas for community health planning. It is the Department's intention to foster in each of these areas the development of Community Health Networks – consortia of health care providers, human service agencies, schools, churches, youth, parents, elders, advocacy groups, and individual consumers – to address the health needs of the community. These community coalitions will participate in monitoring outcomes and progress of strategies and responses to those health needs.

It is hoped the Networks will mobilize around key health issues impacting the community, promote prevention efforts, enhance access to care, provide opportunities for more collaboration among agencies, and create a client-centered, outcome-oriented health service delivery system. Community Health Networks will also promote efficiency in service delivery by working to reduce duplication and overlap, and by identifying gaps in service.

A Community Health Network Area (CHNA) is defined as an aggregation of cities and towns. In

the current publication, we have presented some data by CHNA. To determine which cities and towns make up a particular CHNA, Table A1 provides the appropriate CHNA code for each city and town. The data published in this volume reflect the definitions of CHNAs instituted in January 1997 and the corresponding CHNA names.

Confidence Intervals
The confidence interval (CI) for the infant mortality rate (IMR) is a range of values that has a 95% chance of including the underlying risk of an infant death. Observed rates are subject to statistical variation; even if the underlying risk of infant death is identical in two subpopulations, the observed IMRs for the subpopulations may differ because of random variation. The confidence interval describes the precision of observed IMR as an estimate of the underlying risk of infant death, with a wider interval indicating less certainty about this estimate. The width of the interval reflects the size of the subpopulation and the number of infant deaths; smaller subpopulations with fewer infant deaths lead to wider confidence intervals.

Death Cohort Linked File or Linked Birth and Infant Death File – Death Cohort
All infant deaths occurring in a specific year have been linked to their corresponding birth certificates, whether the birth occurred during the same year or in the previous one. This is in contrast to a birth cohort linked file, in which infant deaths may have occurred in the same year or in the year following the year of birth.

Delivery
A delivery may consist of one or more live born or stillborn fetuses. The number of deliveries in a given period will be equal to or less than the number of births because multiple births (twins, triplets or higher–order births) are counted as single deliveries.

EOHHS Regions
The six regions delineated by the commonwealth's Executive Office of Health and Human Services and used by the Department of Public Health for statistical, care coordination and administrative purposes. The regions - Western, Central, Northeast, Metro West, Boston and Southeast - are based on geographical groupings of cities and towns.

Ethnicity
Also known as mother's ancestry. See the section in the Technical Notes of the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

Fetal Death
A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighs 350 grams or more.

Feto-Infant Mortality Rate
The combined number of fetal deaths and infant deaths per 1,000 live births and fetal deaths.

Healthy Start
A Massachusetts-funded program providing services and financing for prenatal care to low-income pregnant women who lack health insurance, but do not qualify for Medicaid.

Infant
A child whose age is less than one year (365 days).

Infant Death
Death of a child whose age is less than one year.

Kessner Index (Adequacy of Prenatal Care)
A measure of adequacy of prenatal care, used in *Advance Data: Births* and *Massachusetts Births* publications prior to 2001. The Kessner Index classifies prenatal care as one of 5 categories (adequate, intermediate, inadequate, no prenatal care, and unknown), based on the trimester in which prenatal care began and the number of prenatal visits. The classification adjusts for gestational age to allow for proper classification of premature births, and is as follows:

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
Inadequate	1	1-4
	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	Unknown	Unknown

Live Birth
A live birth is any infant who breathes or shows any other evidence of life (such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles) after separation from the mother's uterus, regardless of the duration of gestation.

Low Birthweight (LBW)
See Birthweight Categories.

Maternal Death
The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes.

Mother's Birthplace
In this publication, birth characteristics are presented according to mother's birthplace: those who were born in the 50 states and District of Columbia, or "U.S. States / D.C."; those who were born in Puerto Rico, the US Virgin Islands, and Guam, or "Puerto Rico/U.S. Territories"; and those who were born outside of the U.S. and Puerto Rico/U.S. territories, or "Non-U.S.-Born".

Neonatal
Infants under 28 days of age.

Neonatal Death
Death of a child whose age is less than 28 days.

Non-U.S.-Born Women
See Mother's Birthplace.

Occurrence Birth
A birth occurring in the Commonwealth of Massachusetts, regardless of the residency of the mother. For individual cities/towns, an occurrence birth represents any birth occurring in that city/town, regardless of the residence of the mother. See Resident Birth.

Parity
The total number of live infants ever born to a woman, including the current birth.

Perinatal
Referring to the time period immediately before and after birth (28 weeks of gestation to 7 days after birth).

Perinatal Death
Death to a fetus of 28 weeks gestation or older or a live-born infant less than 7 days old.

Plurality
The number of births to a woman produced in the same gestational period. A singleton is the birth of one infant; twins represent the births of two infants, etc.

Post Neonatal
A child whose age is at least 28 days, but less than one year.

Post Neonatal Death
Death of a child whose age is at least 28 days, but less than one year.

Prenatal Care Source of Payment
Categories used in this publication include:

Public = Government programs including Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care;
Private = Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance;
Other = Worker's Compensation and other sources;
Self-paid.

Pregnancy-Associated Death
The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause.

Race
See the section in the Technical Notes in the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

Resident Birth
The birth of an infant whose mother reports that her usual place of residence is in Massachusetts. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Vital statistics data may be presented in terms either of residence or occurrence. All data in this publication are resident data unless otherwise stated. Resident data include all events that occur to residents of the Commonwealth, wherever they occur. Occurrence data include all events that occur within the state, whether to residents or nonresidents. There is an exchange agreement among the 50 states, District of Columbia,

Puerto Rico, Virgin Islands, Guam, and Canadian provinces that provides for exchange of copies of birth and death records. These records are used for statistical purposes only, and allow each state or province to track the births and deaths of its residents.

Vaginal Birth After Cesarean (VBAC)
A vaginal delivery of an infant to a mother who has had at least one prior cesarean delivery.

Very Low Birthweight (VLBW)
An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

Massachusetts Birth Certificate: 2007

USE ONLY STATE APPROVED RIBBONS AND MASS. STANDARD INK
AS REQUIRED BY GEN. LAWS, CHAP. 66, SECT. 4

STATE USE ONLY

The Commonwealth of Massachusetts
DEPARTMENT OF PUBLIC HEALTH
REGISTRY OF VITAL RECORDS AND STATISTICS
STANDARD CERTIFICATE OF LIVE BIRTH

1. RECORD NUMBER: 768283
1A. CERTIFICATE NUMBER (DPH USE ONLY)

CHILD

3. PLACE OF BIRTH
3C. CITY/TOWN
3B. COUNTY
3A. FACILITY NAME-IF NOT IN FACILITY, NUMBER AND STREET
3D. REGISTERED NUMBER

NAME 4A. FIRST 4B. MIDDLE 4C. LAST

SAMPLE

2. FACILITY NUMBER

5. SEX | 6A. PLURALITY | 6B. BIRTH ORDER | 7. TIME | 8. DATE OF BIRTH (Month, Day, Year)

CERTIFIER

9A. NAME | 9B. TITLE
9C. CERTIFIER TYPE | 9D. LICENSE NUMBER
9E. NUMBER AND STREET | 9F. CITY/TOWN | 9G. STATE | 9H. ZIP CODE

MOTHER

NAME 10A. FIRST 10B. MIDDLE 10C. LAST 10D. MAIDEN SURNAME

BIRTHPLACE 11A. CITY/TOWN 11B. STATE/COUNTRY | 12. DATE OF BIRTH (Month, Day, Year)

RESIDENCE (Do not use mailing address) 13A. NUMBER AND STREET 13B. CITY/TOWN 13C. COUNTY 13D. STATE 13E. ZIP CODE

FATHER

NAME 14A. FIRST 14B. MIDDLE 14C. LAST

22A. SOCIAL SECURITY CARD

BIRTHPLACE 15A. CITY/TOWN 15B. STATE/COUNTRY | 16. DATE OF BIRTH (Month, Day, Year)

INITIALS

INFORMANT

17A. I (WE) CERTIFY THAT THE PERSONAL INFORMATION APPEARING ABOVE IS TRUE AND CORRECT. | 17B. RELATIONSHIP TO CHILD

22B. RESIDENT COPY

17C. DATE SIGNED (Month, Day, Year) | 17D. MAILING ADDRESS (If different from item # 13 above) NUMBER AND STREET CITY STATE ZIP CODE

INITIALS

CLERK

18. DATE OF RECORD (Month, Day, Year) | 19. SUPPLEMENT FILED (Month, Day, Year) | 20. CLERK/REGISTRAR

1. OCCURRENCE

21. DPH USE ONLY

R-101 • 100M • 10-98

Massachusetts Births 2007 Evaluation Form

TO OUR READERS:
In an attempt to better serve our users, we are enclosing this evaluation form. Please take the time to complete this questionnaire and return it to the address at the bottom of the page. Thank you.

What tables and charts do you find most useful?
What tables and charts do you find least useful?
Are there other tables and charts that you would like added to this publication? If yes, please describe them in detail.
Do you have other comments or suggestions?
Name (optional): **Address:** **(For those who received the publication by mail)** Is the mailing label address correct? If not, please correct the address. Thank you.

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Division of Research and Epidemiology
Bureau of Health Information, Statistics, Research and Evaluation
Massachusetts Department of Public Health
250 Washington Street, 6th floor, Boston, MA 02108

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Boston, MA 02108

Slide 1:
Massachusetts Births 2007

Slide 2: Outline

I. Overview and Trends
II. Changing Demographics
III. Diversity and Disparities
IV. Selected Topics:
    I. Preterm infants
    II. Smoking during pregnancy
    III. Gestational diabetes
    IV. Cesarean deliveries
V. Summary

Slide 3: Title slide- Overview and Trends

Slide 4: On an average day in Massachusetts, in 2007
In 2007, there were 77,934 resident births. On an average day in Massachusetts in 2007 there were:

- 214 births
- 72 births delivered by Cesarean (1 out of 3)
- 20 births with inadequate prenatal care
- 19 Preterm births (<37 weeks gestation)
- 17 low birth weight infants (<5.5 pounds or 2500 grams)
- 14 teen births (women ages 15-19)
- 9 births whose mothers were diagnosed with gestational diabetes
- 5 sets of twins
- 1 infant death (death of a child under the age of 1)

Slide 5: Massachusetts Births: 2000 vs. 2007
Here we look at birth indicators for 2007 and how they have changed since 2000.

- The **number of births** has decreased 5% from 2000.
- And the asterisk indicates that this change is statistically significant, that is, it is unlikely to have happened by chance alone. You will see this notation throughout today's presentation, so please keep this in mind.

There have been increases in foreign born mothers, LBW, preterm infants, GDM, and cesarean deliveries. The teen birth rate and smoking have decreased.

Slide 6: A Comparison of 2007 Massachusetts Birth Indicators with Recent U.S. Data
Here we compare Massachusetts indicators with indicators for the US as a whole. At the time of this report was done, 2007 data was not available, so we are presenting

here 2006 final data for the US instead; but as in last year's, Massachusetts does very well when compared with the US.

- The **Teen Birth Rate** is significantly lower, almost ½ the US rate
- The **percent Low Birthweight** is almost 5% lower than that of the US.
- The **percent of mothers Smoking during pregnancy** also was about 76% lower.
- The **Infant Mortality Rate (IMR)** was 26% lower than that of the US (provisional figure for 2007)
- The **percent Cesarean deliveries in** Massachusetts is significantly higher than that of the US. In 2007, 1/3 of all births were delivered by C-section.

Slide 7: **Title slide- Changing Demographics**

Slide 8: **Trend in the Number of Births, Massachusetts: 1990-2007**
This chart shows the trend in the number of births in Massachusetts from 1990 to 2007 using Joinpoint analysis (JP). As you might remember, we use JP to test trends and look at annual percentage change over time periods- and as always an asterisk denotes statistical significance.

So, here we see that the rate of decline in the number of births has slowed down lately. Between 1990 and 1996 it declined significantly by 2% per year and since 2000 it has been declining at 0.8% per year. It is important to note that the actual number of births has been increasing in the last couple of years and this is something we need to continue to follow up to see if It is the beginning of a trend.

Slide 9: Massachusetts births by Race and Hispanic Ethnicity, Massachusetts: 1990
This slide shows the racial diversity in our birth population.

- If we go back to 1990 and we group all minority mothers (mothers other than white)- we see that 1 out of 5 births was to a minority mother, whereas in 2007, it was 1 out of 3 births.

Slide 10: Massachusetts births by Race and Hispanic Ethnicity, Massachusetts: 2007

- whereas in 2007, it was 1 out of 3 births.

Slide 11: **Percent Non-U.S. Born Mothers, Massachusetts: 1990-2007**
Population growth and our diversity is also represented by the increase in the percentage of foreign born mothers. Here, the blue bars represent the proportion of births to mothers born outside the US (born outside the 50 states, PR or US Territories)

- In 1990, 1 out of 7 births was to a foreign born mother whereas,
- in 2007, more than 1 out of 4 births was to a foreign born mother (27.2%).

Slide 12: Number of Births by Mother's Age, Massachusetts: 1990-2007
Another important trend is the change in the age distribution of mothers giving birth in Massachusetts.

Mothers ages 30 and over have made up the largest proportion of mothers since 1996, but it is important to note that in recent years, this trend seems to be reversing: our trend analysis shows that the number of births mothers ages 30 and older has been significantly decreasing by about 2% per year since 2002, while the number of births to mothers younger than 30 has been increasing by 2% since 2004.

Slide 13: Percent Multiple Births, Massachusetts: 1990-2007
Another trend is the leveling off and decrease in the percent of multiple births in Massachusetts. Looking at our trend line, multiple births increased by 5% per year between 1990 and 2002, and then leveled off and have been decreasing at about 2% per year since 2002.

Slide 14: Title slide- Diversity and Disparities

Slide 15: Births to Teens (15-19 years), Massachusetts and US: 1990-2007
On this slide we see teen birth rates for Massachusetts and the US since 1990.
--The blue line shows the Massachusetts teen birth rate since 1990, and the purple line shows the US teen birth rate.

--Teen birth rates in US have been consistently higher than teen birth rates in the Commonwealth (almost twice the Massachusetts average).

--Hispanics have the highest teen birth rates both in Massachusetts and the US and as we can see here in green, rates for Hispanics in Massachusetts are consistently higher than the state overall as well as the overall rate for the US.

Slide 16: Infant Mortality Rate (IMR), Massachusetts: 1990- 2007
Let's examine the Infant Mortality Rate (deaths per 1,000 live births) in Massachusetts since from 1990 to 2007, shown here by the blue line.

After a continued decline in IMR from 1990 to 1996, the overall IMR in MA has leveled off in the last decade as we can see here- there has not been any significant change since 1996.

Slide 17: Infant Mortality Rate (IMR) by Race and Hispanic Ethnicity, Massachusetts: 1990- 2007
This graph shows the persistent disparities in the IMR by race and Hispanic ethnicity since 1990.

The bottom (purple) line represents the White non-Hispanic IMR. The middle (blue) line is the Hispanic IMR. And the top (green) line is the Black non-Hispanic IMR, which is the highest of all groups: more than twice as high as the white non-Hispanic IMR.

Using our trend analysis, we can see that both the WNH IMR and the BNH IMR have been declining at about 2% per year since 1990

Slide 18: Hispanic IMR, Massachusetts: 1990-2007
On the other hand, we see that the Hispanic IMR has leveled off in the last 10 years – remained stable after declining from 1990 to 1996

Slide 19: Highest IMR Among the 30 largest Communities in Massachusetts: 2007
On this next slide we present the communities with the highest IMRs in 2007 among the largest cities/towns (HP2010 Target = 4.5)

In 2007, Fall River (13.1 deaths per 1,000 live births) had a significantly higher infant mortality rate (IMR) than the state IMR of 4.9 deaths per 1,000 live births.– almost 3 times higher.

Slide 20: Highest IMR Among the 30 largest Communities in Massachusetts: 2005-2007
In order to get more stable rates, here we present 3-year averages in IMR for the same communities, and we can see significant differences. We see that Fall River has dropped in rank, and Somerville dropped out altogether. And, the highest IMRs are found in Revere, Springfield, Worcester and New Bedford, all have significantly higher IMRs than the State average.

Slide 21: Birth Characteristics by Maternal Education, Massachusetts: 2007
On this next slide, we compare birth outcomes and mothers characteristics by education attainment.

Least educated = or mothers with less than a high school education and in the light colored bars
Whereas Most educated = or mothers with a college degree or more are in the dark colored bars

- The least educated mothers are more likely to:
  - smoke during pregnancy
  - are 14 times more likely to receive publicly financed prenatal care

- These mothers are also less likely to:
  - have Cesarean deliveries
  - have multiple births
  - breastfeed their newborns
  - and, receive adequate prenatal care.

Slide 22: Title slide- Selected Topics

Slide 23: Preterm Deliveries by Gestational Age, Massachusetts: 1990-2007
On this next slide, we present preterm births in MA since 1990 broken down by gestational age: on the bottom is the <28 weeks (extremely preterm) in purple, 28-33 weeks (moderately preterm) in orange, and 34-36 weeks (late preterm) in green. This blue line shows the trend in the % of all births < 37 weeks (preterm).

The increase in preterm births is driven by the increase in late preterm births. Trend analysis shows that late preterm has increased by 3% APC since 1997. The increase in late preterm births is of concern because these babies comprise more than 70 percent of all preterm births and, although infants born at 34–36 weeks are at lower risk of adverse outcome compared with infants born at earlier gestational ages, they are at heightened risk when compared with infants delivered at higher ages.

Slide 24: Women who Smoked During Pregnancy, Massachusetts: 1990-2007
On this slide, the blue line shows the decreasing trend in the % of mothers who smoked during their pregnancies.

In 1990; **1 out of 5** mothers reported smoking during pregnancy whereas; in 2007, only **1 out of 13** mothers reported smoking during pregnancy

So, here we see that the rate of decline in smoking during pregnancy has slowed down lately. Between 1990 and 1999 it declined significantly by 6% per year. Between 1999 and 2003, it declined significantly at about 9% per year and since 2003 it appears to plateau, has not changed significantly (driven by white mothers who have shown increased in the percent of smoking-though not significant). This something we need to continue to follow up to see if It is the beginning of a trend.

Slide 25: Tobacco Control Program- Rural Birth Hospital- Pilot Program
Here is an example from the Massachusetts in how data can drive policy and intervention.

The Tobacco Control Program at DPH is piloting a program aimed at getting doctors to ask pregnant women and women of child-bearing age about their smoking behavior. The pilot is being conducted in three hospitals located in rural and low income areas. The goal of the pilot is to have all visits tracked electronically in order to ensure that all patients are asked if they smoke, advised to quit if they do smoke, and referred to smoking cessation counseling to help them quit.

Slide 26: Tobacco Control Program- program of Brief Intervention Rates- North Adams Regional Hospital
Here are the results after the implementation of this program at North Adams Hospital after implementing this program in 2007.

North Adams Hospital has been collecting data longer than other 2 hospitals

- After one year of using the electronic data collection system (with reports back to Doctors), there have been dramatic improvements in intervention rates
- Conclusions:
    - Piggybacking on existing Electronic Medical Record (EMR) is essential to program success
    - Feedback to doctors must be rapid and specific (i.e., monthly report by physician)

Slide 27: Gestational Diabetes Mellitus (GDM), Massachusetts: 2000-2007
Gestational diabetes mellitus (GDM) continues to be an emerging health issue which we have been monitoring since last year.

The percent of births to mothers diagnosed with GDM has been increasing since 2000 at a rate of 5% per year. In 2007, 4.2% of births were to mothers diagnosed with GDM, compared with 2.8% in 2000.

Dr. Lauren Smith will be speaking after my presentation, about efforts here at DPH to address this increase in GDM and the increased in cesarean deliveries.

Slide 28: Cesarean Deliveries, Massachusetts and the US: 1990-2007
Let's examine the Cesarean delivery rate:

- The purple line is the U.S. C-section rate since 1990
- The blue line is the Massachusetts C-section rate for the same period
- The curves follow a similar pattern, but the Massachusetts rate has been higher since 1999
- The trend analysis shows a significant change in the C-section trend after 1997.
    - Before that, the C-section rate had been decreasing significantly by about 2% per year.
    - After 1997, the Massachusetts C-section rate increased significantly at the rate of about 7% per year until 2003, when the rate of increase slowed down to 3%APC
    - It is important to note that in 2007, the Cesarean section delivery rate did not increase from previous year for the first time since 1998. The rate in 2007 was 33.7%, similar to the rate in 2006 of 33.4%.

Slide 29: Title Page- Summary

Slide 30: Summary
There have been, over time, many improvements in birth outcomes in Massachusetts, and MA continues to compare very favorably with U.S. indicators including LBW, smoking, and teen birth rates.

- In MA, the birth population is changing- more diverse, more foreign born

- But, we have seen increases in many indicators such as GDM, LBW, and late preterm.
- And after decreasing for several years, smoking during pregnancy has leveled off in recent years

Slide 31: Summary– Disparities Persist by Race, Ethnicity, Geography, and SES
But Massachusetts must continue to address the persistent disparities in birth outcomes by race/ethnicity; education, and community, for example,

- For example, the black IMR is almost 3 times as high as that of the white's IMR, teen birth rate for Hispanics is almost six times that of Whites.
- There is also variation across communities, for example smoking during pregnancy varied from less than 1% to 28%
- And, education matters: less educated women were more likely to smoke during their pregnancies, less likely to breastfeed and less likely to receive adequate prenatal care

Slide 32: Infant Mortality Rate, Massachusetts: 1842-2007
This slide shows IMR from 1842-2007. We are indeed fortunate in Massachusetts to be able to collect and use information such as this to guide our policies and identify areas for intervention.

We need to recognize the importance of the data just presented (i.e. birth certificate data) for development of programs such as newborn screening, high-risk infant identification and immunization tracking as well as for research and surveillance. It is extremely important that all physicians, other medical professionals, and hospital administrators sustain their efforts to provide timely data of the highest quality.
The Registry of Vital Records and Statistics plays a critical role in the collection of birth information. Their work provides the basic information that guides many public health initiatives.

This graph of IMRs in Massachusetts over time shows that we have been collecting data and calculating IMRs since 1842 --the data were important then, and they continue to be as important as ever today.

Slide 33: How Can You Access the Massachusetts Births 2007 Report?
Hard copies of *Massachusetts Births 2007* are available by calling the numbers:

- Hard Copies: (617) 740-2670

- TDD/TTY: (617) 624-6001

An electronic copy of *Massachusetts Births 2007* and this presentation can be downloaded from the DPH web site as of today.

Slide 34: Thank you.